

Sheet feeder

Patent Number: ☐ US2002054381
Publication date: 2002-05-09
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Requested Patent: ☐ JP2002060068
Application Number: US20010925534 20010810
Priority Number(s): JP20000242385 20000810
IPC Classification: H04N1/04
EC Classification: H04N1/00F, B65H3/06B
Equivalents:

Abstract

In a sheet feeder, when rotating force transmitted to a transmission gear is smaller than frictional force generated on a contact surface between a friction sheet and a transmission plate, the transmission plate is rotated together with the transmission gear, so that a drive shaft may rotate together with the transmission plate and the transmission gear. When the rotating force transmitted to the transmission gear is greater than the frictional force generated on the contact surface between the friction sheet and the transmission plate, each of surfaces of the friction sheet contacting the transmission plate and the transmission plate contacting the friction sheet slidably move, so that the transmission gear may rotate freely relative to the drive shaft. Thus, the sheet feeder restricts excessive rotating force being transmitted to a pick-up roller, so that damage or malfunction of the pick-up roller or a drive unit is prevented

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(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号
特開2002-60068
(P2002-60068A)

(43) 公開日 平成14年2月26日 (2002.2.26)

(51) Int.Cl. ⁷	識別記号	F I	タームコード* (参考)
B 6 5 H 3/06	3 5 0	B 6 5 H 3/06	3 5 0 C 3 F 3 4 3
	3 4 0		3 4 0 E

審査請求 未請求 請求項の数 8 O L (全 16 頁)

(21) 出願番号 特願2000-242385(P2000-242385)

(22) 出願日 平成12年8月10日 (2000.8.10)

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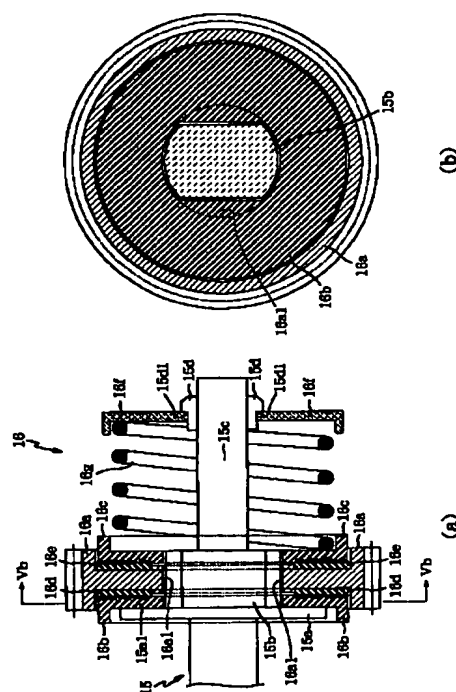
Fターム(参考) 3F343 FA02 FB02 FB03 FB04 FC27
GA02 GB01 GC01 GD01 JA14
JA18 KB04 LA04 LA15 LD30

(54) 【発明の名称】 給紙装置

(57) 【要約】

【課題】 駆動装置から給紙ローラに伝達される過大な回転力を抑制して、かかる給紙ローラや駆動装置の破損や故障を防止することができる給紙装置を提供すること。

【解決手段】 伝達ギヤ16aに伝達される回転力が摩擦シート16d、16eと伝達プレート16b、16cとの当接面間に生じる摩擦力よりも小さい場合は、この摩擦力を介して、伝達プレート16b、16cが伝達ギヤ16aと一体となって回転され、駆動軸15が伝達ギヤ16a及び伝達プレート16b、16cと一体となって回転される。一方、伝達ギヤ16aに伝達される回転力が摩擦シート16d、16eと伝達プレート16b、16cとの当接面間に生じる摩擦力よりも大きい場合には、摩擦シート16d、16eと伝達プレート16b、16cとの当接面同士が滑動されるので、伝達ギヤ16aが駆動軸15に対して相対的に空転され、この空転により駆動軸15に伝達される回転力が制限される。



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【特許請求の範囲】

【請求項 1】 用紙を保持する用紙保持部材と、その用紙保持部材に載置される用紙を搬送する給紙ローラと、その給紙ローラを回転可能に軸支するホルダ部材と、そのホルダ部材を支持すると共に前記給紙ローラに直接的又は間接的に連結される駆動軸と、その駆動軸の軸方向両端部を回転可能に軸支するフレーム体と、そのフレーム体により軸支される前記駆動軸に回転力を付与する駆動装置とを備えた給紙装置において、前記駆動軸の軸方向一端部を回転可能に内包すると共に 10 前記駆動装置による回転力が伝達される伝達部材と、その伝達部材を前記駆動軸に所定の摩擦力で圧接する圧接部材とを備えていることを特徴とする給紙装置。

【請求項 2】 前記駆動軸は、その駆動軸の軸方向一端部に前記伝達部材に隣接して設けられると共にその伝達部材の側面と当接される当接面を備え、前記圧接部材は、前記伝達部材を前記当接面へ向けて付勢する付勢部材を備えていることを特徴とする請求項 1 記載の給紙装置。

【請求項 3】 前記ホルダ部材は、そのホルダ部材を支持する前記駆動軸が 1 の方向へ回転する場合にその駆動軸と前記給紙ローラとを連結し、前記駆動軸が他の方向へ回転する場合にその駆動軸と前記給紙ローラとの連結状態を解除するクラッチ部材を前記駆動軸と前記給紙ローラとの間に備えていることを特徴とする請求項 1 または 2 に記載の給紙装置。 20

【請求項 4】 前記クラッチ部材は、前記給紙ローラに連結される第 1 ギヤと、その第 1 ギヤから離間して前記駆動軸に設けられその駆動軸と一体となって回転する第 2 ギヤと、その第 2 ギヤが設けられる前記駆動軸を回転可能に挿嵌するカラー部とそのカラー部から外方へ延出され前記第 1 ギヤ側またはその反対側へ揺動可能に形成される延出部とを有するアーム部材と、そのアーム部材の延出部に回転可能に軸支され前記第 2 ギヤに歯合されるクラッチギヤと、そのクラッチギヤに歯合される前記第 2 ギヤの回転に連動させて前記アーム部材を揺動させるため、前記クラッチギヤに負荷を付与する抵抗部材とを備えていることを特徴とする請求項 3 記載の給紙装置。 30

【請求項 5】 前記ホルダ部材は、前記駆動軸に対して 40 回転可能に支持されており、前記駆動軸が 1 の方向へ回転する場合にその駆動軸と前記給紙ローラとを連結すると共に前記駆動軸が他の方向へ回転する場合にその駆動軸の回転力を前記ホルダ部材に伝達してそのホルダ部材を前記用紙保持部材側とは反対側へ押動するクラッチ部材を前記駆動軸と前記給紙ローラとの間に備えていることを特徴とする請求項 1 または 2 に記載の給紙装置。

【請求項 6】 前記クラッチ部材は、前記給紙ローラに連結される第 1 ギヤと、その第 1 ギヤから離間して前記駆動軸に設けられその駆動軸と一体となって回転する第 50

2 ギヤと、その第 2 ギヤが設けられる前記駆動軸を回転可能に挿嵌するカラー部とそのカラー部から外方へ延出され前記第 1 ギヤ側またはその反対側へ揺動可能に形成される延出部とを有するアーム部材と、そのアーム部材の延出部に回転可能に軸支され前記第 2 ギヤに歯合されるクラッチギヤと、そのクラッチギヤに歯合される前記第 2 ギヤの回転に連動させて前記アーム部材を揺動させるため、前記クラッチギヤに負荷を付与する抵抗部材と、前記ホルダ部材に設けられ前記給紙ローラを軸支すると共に前記アーム部材により前記第 1 ギヤ側とは反対側へ押動されるホルダフレームとを備えていることを特徴とする請求項 5 記載の給紙装置。

【請求項 7】 前記第 1 ギヤは、前記アーム部材の延出部に軸支される前記クラッチギヤに対して前記用紙保持部材側に設けられ、前記アーム部材の延出部がその用紙保持部材側へ揺動されることにより前記クラッチギヤと歯合するものであることを特徴とする請求項 4 または 6 に記載の給紙装置。

【請求項 8】 前記ホルダ部材は、前記クラッチギヤが前記第 1 ギヤに歯合された場合に、前記アーム部材の前記第 1 ギヤ側への揺動動作を制限する制限部材を備えていることを特徴とする請求項 4 または 6 に記載の給紙装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、複写機、プリンタ、ファクシミリ等の画像形成装置に用いられる給紙装置に関し、特に、駆動装置から給紙ローラに伝達される過大な回転力を抑制して、かかる給紙ローラや駆動装置の破損や故障を防止することができる給紙装置に関するものである。

【0002】

【従来の技術】 ファクシミリ等に用いられる給紙装置には、積層された複数の記録紙の上面に給紙ローラを当接させ、その給紙ローラを記録紙の搬送方向に回転させることにより、記録紙を所定の搬送方向へ搬送するよう構成されているものがある。この種の給紙装置では、一般に、記録紙を搬送する給紙ローラと、回転力を発生するモータと、そのモータの回転力を給紙ローラに伝達する複数のギヤとを備えている。この給紙装置によれば、モータの回転力は複数のギヤにより給紙ローラに伝達され、この伝達によって給紙ローラが記録紙の搬送方向に回転されて記録紙が搬送されるのである。

【0003】

【発明が解決しようとする課題】 しかしながら、上記の給紙装置では、モータと給紙ローラとが複数のギヤを介して常に連結されるので、紙詰まり等により給紙ローラの回転が抑止されたり、給紙ローラの回転抵抗が増加しても、給紙ローラや複数のギヤにモータの回転力が伝達され続けてしまう。このため、給紙ローラや複数のギヤ

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に過大な回転負荷が作用し、これら給紙ローラやギヤが破損してしまうという問題点があった。また、モータもその回転を抑止されることにより、駆動パルス信号通りに駆動せず、正逆転方向の回転を繰り返すことに起因する騒音が発生したり、更には、モータ自体が故障してしまうといった問題点があった。

【0004】本発明は、上述した問題点を解決するためになされたものであり、駆動装置から給紙ローラに伝達される過大な回転力を抑制して、かかる給紙ローラや駆動装置の破損や故障を防止することができる給紙装置を提供することを目的としている。

【0005】

【課題を解決するための手段】この目的を達成するために、請求項1記載の給紙装置は、用紙を保持する用紙保持部材と、その用紙保持部材に載置される用紙を搬送する給紙ローラと、その給紙ローラを回転可能に軸支するホルダ部材と、そのホルダ部材を支持すると共に前記給紙ローラに直接的又は間接的に連結される駆動軸と、その駆動軸の軸方向両端部を回転可能に軸支するフレーム体と、そのフレーム体により軸支される前記駆動軸に回転力を付与する駆動装置とを備え、前記駆動軸の軸方向一端部を回転可能に内包すると共に前記駆動装置による回転力が伝達される伝達部材と、その伝達部材を前記駆動軸に所定の摩擦力で圧接する圧接部材とを備えている。

【0006】この請求項1記載の給紙装置によれば、駆動装置の回転力は、伝達部材に伝達される。伝達部材は、フレーム体に軸支された駆動軸の軸方向一端部を回転可能に内包すると共に、圧接部材による所定の摩擦力で駆動軸に圧接されている。よって、駆動装置により伝達部材に伝達された回転力は、圧接部材による摩擦力を介して、伝達部材から駆動軸に伝達される。駆動軸に伝達された回転力は、ホルダ部材により軸支された給紙ローラに伝達され、この伝達によって給紙ローラが用紙の搬送方向へ回転され、用紙保持部材に載置される用紙が搬送される。

【0007】一方、圧接部材による所定の摩擦力を越える回転力が伝達部材に加わると、伝達部材は駆動軸に対して滑動されて、駆動軸の軸方向一端部で空転される。よって、駆動装置により伝達部材に伝達される回転力は、圧接部材による所定の摩擦力より小さな力に制限されるのである。

【0008】請求項2記載の給紙装置は、請求項1記載の給紙装置において、前記駆動軸は、その駆動軸の軸方向一端部に前記伝達部材に隣接して設けられると共にその伝達部材の側面と当接される当接面を備え、前記圧接部材は、前記伝達部材を前記当接面へ向けて付勢する付勢部材を備えている。

【0009】この請求項2記載の給紙装置によれば、請求項1記載の給紙装置と同様に作用する上、駆動装置の

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回転力が伝達される伝達部材は、付勢部材によって駆動軸の軸方向一端部に設けられる当接面へ向けて付勢される。この付勢力により、伝達部材の側面は駆動軸の当接面に圧接され、かかる圧接により伝達部材の側面と駆動軸の当接面との間に摩擦力が付与される。かかる摩擦力より小さな回転力が伝達部材に加わる場合には、その摩擦力を介して伝達部材の回転が駆動軸に伝達される。一方、上記の摩擦力を越える回転力が伝達部材に加わる場合には、伝達部材の側面が駆動軸の当接面に対して滑動され、伝達部材が駆動軸の軸方向一端部で空転される。

【0010】請求項3記載の給紙装置は、請求項1または2に記載の給紙装置において、前記ホルダ部材は、そのホルダ部材を支持する前記駆動軸が1の方向へ回転する場合にその駆動軸と前記給紙ローラとを連結し、前記駆動軸が他の方向へ回転する場合にその駆動軸と前記給紙ローラとの連結状態を解除するクラッチ部材を前記駆動軸と前記給紙ローラとの間に備えている。

【0011】この請求項3記載の給紙装置によれば、請求項1または2に記載の給紙装置と同様に作用する上、用紙を搬送方向下流側へ搬送する場合、駆動軸が1の方向へ回転されると、その駆動軸と給紙ローラとの間に設けられるクラッチ部材によって、駆動軸と給紙ローラとが連結される。この連結により、駆動軸の回転が給紙ローラに伝達され、給紙ローラが用紙の搬送方向へ回転され、用紙保持部材に載置される用紙が搬送方向へ搬送される。一方、用紙の搬送が完了した後に、駆動軸が他の方向へ回転されると、クラッチ部材によって、駆動軸と給紙ローラとの連結状態が解除される。この連結状態の解除により、給紙ローラが用紙の反搬送方向へ向けて空転可能な状態とされる。

【0012】請求項4記載の給紙装置は、請求項3記載の給紙装置において、前記クラッチ部材は、前記給紙ローラに連結される第1ギヤと、その第1ギヤから離間して前記駆動軸に設けられその駆動軸と一体となって回転する第2ギヤと、その第2ギヤが設けられる前記駆動軸を回転可能に挿嵌するカラー部とそのカラー部から外方へ延出され前記第1ギヤ側またはその反対側へ揺動可能に形成される延出部とを有するアーム部材と、そのアーム部材の延出部に回転可能に軸支され前記第2ギヤに歯合されるクラッチギヤと、そのクラッチギヤに歯合される前記第2ギヤの回転に連動させて前記アーム部材を揺動させるため、前記クラッチギヤに負荷を付与する抵抗部材とを備えている。

【0013】この請求項4記載の給紙装置によれば、請求項3記載の給紙装置と同様に作用する上、駆動軸が1の方向へ回転されると、その駆動ギヤと一体となって第2ギヤが回転される。この第2ギヤにはアーム部材の延出部に軸支されたクラッチギヤが歯合されており、このクラッチギヤには抵抗部材により負荷が付与されている。このため、駆動軸が第2ギヤと一体となって1の方

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向へ回転されると、アーム部材の延出部は、抵抗部材により負荷が付与されたクラッチギヤを軸支しつつ、第2ギヤの回転に連動して駆動軸を揺動中心に第1ギヤ側へ揺動され、この揺動によって、クラッチギヤは第1ギヤと歯合される。この歯合後、駆動軸に更に大きな回転力が加わると、その駆動軸はアーム部材のカラ部内で滑動しつつ回転され、第2ギヤに歯合されたクラッチギヤは、抵抗部材による負荷に抗しつつ、第2ギヤにより回転される。このクラッチギヤの回転により第1ギヤが回転されて、給紙ローラが用紙の搬送方向へ回転される。

【0014】一方、駆動軸が他の方向へ回転されると、クラッチギヤの回転は、抵抗部材による負荷により再び抑制される。駆動軸と一体となって第2ギヤが他の方向へ更に回転されると、アーム部材の延出部は、抵抗部材により負荷が付与されたクラッチギヤを軸支しつつ、第2ギヤの回転に連動して駆動軸を揺動中心に第1ギヤ側との反対側へ揺動される。この揺動によりクラッチギヤは第1ギヤから離間され、第1ギヤとの歯合状態が解除されて、第1ギヤに連結される給紙ローラが用紙の反搬送方向へ向けて空転可能な状態とされる。

【0015】請求項5記載の給紙装置は、請求項1または2に記載の給紙装置において、前記ホルダ部材は、前記駆動軸に対して回転可能に支持されており、前記駆動軸が1の方向へ回転する場合にその駆動軸と前記給紙ローラとを連結すると共に、前記駆動軸が他の方向へ回転する場合にその駆動軸の回転力を前記ホルダ部材に伝達してそのホルダ部材を前記用紙保持部材側とは反対側へ押動するクラッチ部材を前記駆動軸と前記給紙ローラとの間に備えている。

【0016】この請求項5記載の給紙装置によれば、請求項1または2に記載の給紙装置と同様に作用する上、用紙を搬送方向下流側へ搬送する場合、駆動軸が1の方向へ回転されると、その駆動軸と給紙ローラとの間に設けられるクラッチ部材によって、駆動軸と給紙ローラとが連結される。この連結により、駆動軸の回転が給紙ローラに伝達され、給紙ローラが用紙の搬送方向へ回転され、用紙保持部材に載置される用紙が搬送方向へ搬送される。一方、用紙の搬送が完了した後に、駆動軸が他の方向へ回転されると、クラッチ部材によって、駆動軸の回転力がホルダ部材に伝達され、そのホルダ部材が用紙保持部材側とは反対側へ押動されて、給紙ローラが用紙保持部材に載置される用紙から離間される。

【0017】請求項6記載の給紙装置は、請求項5記載の給紙装置において、前記クラッチ部材は、前記給紙ローラに連結される第1ギヤと、その第1ギヤから離間して前記駆動軸に設けられその駆動軸と一体となって回転する第2ギヤと、その第2ギヤが設けられる前記駆動軸を回転可能に挿嵌するカラ部とそのカラ部から外方へ延出され前記第1ギヤ側またはその反対側へ揺動可能に形成される延出部とを有するアーム部材と、そのアーム

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部材の延出部に回転可能に軸支され前記第2ギヤに歯合されるクラッチギヤと、そのクラッチギヤに歯合される前記第2ギヤの回転に連動させて前記アーム部材を揺動させるため、前記クラッチギヤに負荷を付与する抵抗部材と、前記ホルダ部材に設けられ前記給紙ローラを軸支すると共に前記アーム部材により前記第1ギヤ側とは反対側へ押動されるホルダフレームとを備えている。

【0018】この請求項6記載の給紙装置によれば、請求項5記載の給紙装置と同様に作用する上、駆動軸が1の方向へ回転されると、その駆動ギヤと一体となって第2ギヤが回転される。この第2ギヤにはアーム部材の延出部に軸支されたクラッチギヤが歯合されており、このクラッチギヤには抵抗部材により負荷が付与されている。このため、駆動軸が第2ギヤと一体となって1の方向へ回転されると、アーム部材の延出部は、抵抗部材により負荷が付与されたクラッチギヤを軸支しつつ、第2ギヤの回転に連動して駆動軸を揺動中心に第1ギヤ側へ揺動され、この揺動によって、クラッチギヤは第1ギヤと歯合される。この歯合後、駆動軸に更に大きな回転力が加わると、その駆動軸はアーム部材のカラ部内で滑動しつつ回転され、第2ギヤに歯合されたクラッチギヤは、抵抗部材による負荷に抗しつつ、第2ギヤにより回転される。このクラッチギヤの回転により第1ギヤが回転されて、給紙ローラが用紙の搬送方向へ回転される。

【0019】一方、駆動軸が他の方向へ回転されると、クラッチギヤの回転は、抵抗部材による負荷により再び抑制される。駆動軸と一体となって第2ギヤが他の方向へ更に回転されると、アーム部材の延出部は、抵抗部材により負荷が付与されたクラッチギヤを軸支しつつ、第2ギヤの回転に連動して駆動軸を揺動中心に第1ギヤ側との反対側へ揺動される。この揺動に伴って、ホルダ部材に設けられるホルダフレームは、アーム部材により第1ギヤ側とは反対側へ押動され、この押動により給紙ローラが用紙保持部材に載置される用紙から離間される。

【0020】請求項7記載の給紙装置は、請求項4または6に記載の給紙装置において、前記第1ギヤは、前記アーム部材の延出部に軸支される前記クラッチギヤに対して前記用紙保持部材側に設けられ、前記アーム部材の延出部がその用紙保持部材側へ揺動されることにより前記クラッチギヤと歯合するものである。

【0021】請求項8記載の給紙装置は、請求項4または6に記載の給紙装置において、前記ホルダ部材は、前記クラッチギヤが前記第1ギヤに歯合された場合に、前記アーム部材の前記第1ギヤ側への揺動動作を制限する制限部材を備えている。

【0022】

【発明の実施の形態】以下、本発明の好ましい実施例について、添付図面を参照して説明する。図1は、本発明の一実施例である給紙装置10(図2参照)を搭載した多機能周辺装置1の外観斜視図である。この多機能周辺

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装置1は、ファクシミリ機能、プリンタ機能、スキャナ機能、コピー機能、及び、ビデオ機能などの各種の機能を備えている。

【0023】図1に示すように、多機能周辺装置1は、略箱状体に形成された装置本体2を備えており、この装置本体2の上面部には操作パネル3が配設されている。操作パネル3には、「0」～「9」の数字ボタン3aや、スタートボタン3bなどの各種のボタンが設けられており、これらのボタンを押下することにより、各種の操作が行われる。操作パネル3の後部には、液晶ディスプレイ(LCD)4が設けられ、多機能周辺装置1の設定状態や各種の操作メッセージなどが必要に応じて表示される。

【0024】LCD4の後部には、ファクシミリ機能時に相手ファクシミリ装置へ送信されるファクシミリ原稿や、コピー機能時に複写されるコピー原稿が、積層載置可能な原稿載置部5が設けられている。この原稿載置部5に載置された各種の原稿は、装置本体2内部へ搬送され、スキャナ(図示せず)によって、その原稿の表面に描かれた画像が読み取られる。画像の読み取られた原稿は、更に搬送され、操作パネル3の下方に設けられた原稿排出部6に排出される。

【0025】原稿載置部5の後部には、複数枚の記録紙Pを積層状態で挿嵌するための空間である記録紙挿嵌部8が設けられている。記録紙挿嵌部8に挿嵌された記録紙Pは、後述する給紙装置10によって装置本体2内へ搬送され、プリンタ(図示せず)によって画像が印刷された後、原稿排出部6の下方に設けられた記録紙排出部9から排出される。

【0026】図2は、多機能周辺装置1に搭載される給紙装置10の外観斜視図であり、図中の矢印Xは、記録紙Pの搬送方向を示している。尚、図2では、駆動モータ(図示せず)の回転力を伝達ユニット16の伝達ギヤ16aに伝達する連結ギヤ17～21(図3参照)の図示を省略している。

【0027】図2に示すように、給紙装置10は、装置本体2の内部に收容される挿嵌部フレーム11と、挿嵌部カバー12とを備え、これらの各部材11、12によって、上記の記録紙挿嵌部8は、記録紙Pを挿嵌可能な空間に構成されている。挿嵌部フレーム11は、主に、載置板11aと、案内板11bと、一対の側壁板11c、11dとを備えており、これらの各部材11a～11dを樹脂等で一体に形成したものである。載置板11aは、記録紙挿嵌部8に挿嵌された記録紙Pを支持するためのものであり、かかる記録紙Pを積層状態で載置可能に形成されている。

【0028】載置板11aは、挿嵌部フレーム11の後部(図2右側)に設けられ、この載置板11aの上端には、その載置板11aより更に上方へ向けて記録紙支持部材13が延設されている。記録紙支持部材13は、略

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コ字状の棒材で構成されており、記録紙Pの用紙長さが大きな場合には、記録紙挿嵌部8に挿嵌された記録紙Pの上側部分を保持して、その記録紙Pの上側部分の垂れ下がり防止をすることができるのである。

【0029】載置板11aは、挿嵌部フレーム11の後部上側(図2右上側)から前部下側(図2左下側)へ向けて下降傾斜され、この載置板11aの下端には、案内板11bの一端(図2右側)が連設されている。案内板11bは、載置板11aに載置される記録紙Pをプリンタ(図示せず)側へ案内するものであり、載置板11aとの連設部分(図2右側)からプリンタ(図示せず)の配設側(図2左側)へ略水平に延設されている。よって、載置板11aに載置された記録紙Pは、案内板11aの上面に沿ってプリンタへ略水平状態で案内されるのである。また、載置板11a及び案内板11bの幅方向両端には、一対の側壁板11c、11dが立設されている。

【0030】一対の側壁板11c、11dは、所定の間隔を隔てて対向されており、載置板11aにおける側壁板11c、11d側には記録紙ガイド11a1、11a2がそれぞれ配置されている。記録紙ガイド11a1、11a2は、挿嵌部フレーム11に設けられるラック(図示せず)及びピニオン(図示せず)により連結されており、これらのラック及びピニオンにより連動して記録紙Pの用紙幅に対応するように載置板11aの幅方向へ移動可能に構成されている。よって、載置板11aに載置される記録紙Pは、一対の記録紙ガイド11a1、11a2の間に挿嵌され、載置板11aに載置されるのである。また、一対の側壁板11c、11dの対向面間には、載置板11aと所定の間隔を隔てて挿嵌部カバー12が挟持されており、この挿嵌部カバー12の幅方向両端は、側壁板11c、11dにそれぞれ取着されている。

【0031】これらの挿嵌部フレーム11の各部材11a～11d及び挿嵌部カバー12で囲まれた空間には、上述した記録紙挿嵌部8が設けられており、この記録紙挿嵌部8には、記録紙Pを挿入可能な給紙口8aが設けられている。また、挿嵌部カバー12と案内板11bとの間には所定幅の隙間が設けられており、この隙間部分に記録紙挿嵌部8から記録紙Pを排出するための排出口8bが設けられている。この排出口8bは、記録紙挿嵌部8の内部と連通されており、記録紙挿嵌部8に挿嵌された記録紙Pが通過可能に形成されている。

【0032】側壁板11dにおける側壁板11cとの非対向面(図2手前側)には、後述する駆動軸15に回転力を伝達する伝達ユニット16が配設され、この伝達ユニット16より下側部分には、略円筒状の軸部11d1～11d4が側壁板11cとの非対向面側(図2手前側)へ突出して設けられている。この各軸部11d1～11d4は、後述する連結ギヤ17～21を軸支するた

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めのものであり、側壁板 11 d の下端側から伝達ユニット 16 側へ向けて、順に略 1 列状に突出されている。

【0033】図 3 は、給紙装置 10 の側面図であり、図中では、各連結ギヤ 17～21 のピッチ円を一点鎖線で図示し、各連結ギヤ 17～21 の外周に刻設されるギヤ歯の図示を省略している。図 3 に示すように、側壁板 11 d から突出される軸部 11 d 1～11 d 4 には、樹脂等で平歯車状に形成された 5 つの連結ギヤ 17～21 がそれぞれ回転可能に軸支されている。連結ギヤ 17 は、軸部 11 d 1 に軸支されており、図示しない駆動モータ 10 (駆動装置) の回転軸に取着されたピニオンギヤ (図示せず) と歯合可能に形成されている。

【0034】連結ギヤ 17 には軸部 11 d 2 に軸支された連結ギヤ 18 が歯合されており、この連結ギヤ 18 には、軸部 11 d 3 に軸支された連結ギヤ 19 が歯合されている。連結ギヤ 19 には、軸部 11 d 4 に軸支された連結ギヤ 20 が歯合されており、連結ギヤ 20 に同心状の連結ギヤ 21 が一体に形成されている。連結ギヤ 21 は、連結ギヤ 20 と共に軸部 11 d 4 に軸支されており、この連結ギヤ 21 は、伝達ユニット 16 の伝達ギヤ 20 16 a に歯合されている。

【0035】駆動モータの回転軸の回転は、ピニオンギヤ、連結ギヤ 17～21 を介して、伝達ギヤ 16 a へ伝達される。即ち、駆動モータの回転軸が回転されると、その回転がピニオンギヤ、連結ギヤ 17～21 の順に伝達され、これらのピニオンギヤ及び連結ギヤ 17～21 が回転される。連結ギヤ 21 に伝達された回転は、連結ギヤ 21 に歯合される伝達ギヤ 16 a に伝達される。更に、伝達ギヤ 16 a に伝達された回転は、伝達ユニット 16 を介して、駆動軸 15 に伝達され、その結果、駆動軸 15 が回転されるのである。

【0036】図 4 は、図 2 の I V-I V 線における断面図であり、図中では、側壁板 11 d に設けられる軸部 11 d 1～11 d 4 および連結ギヤ 17～21 の図示を省略している。図 4 に示すように、載置板 11 a の下部 (図 4 の下側) には、略凹字状の排除口 11 e が設けられており、この排除口 11 e は、載置板 11 a の厚さ方向 (図 4 の紙面に対する垂直方向) に貫通形成されている (図 9 参照)。排除口 11 e は、記録紙 P が給紙装置 10 内部、即ち、記録紙挿嵌部 8 内で詰まった場合に、40 その詰まった記録紙 P を排除するための開口である。

【0037】記録紙挿嵌部 8 の給紙口 8 a より奥側で記録紙 P が詰まった場合には、給紙口 8 a から手を差し込んで、紙詰まりの原因となる記録紙 P を排除する必要があるが、かかる給紙口 8 a は開口幅が狭いため、手を差し込み難い。よって、かかる場合には、載置板 11 d の背面側 (図 9 右側) から排除口 11 e へ手を差し込み、紙詰まりの原因となった記録紙 P を、記録紙挿嵌部 8 内から取り出すことができるのである。

【0038】載置板 11 a 及び案内板 11 b の幅方向 50

(図 4 の左右方向) 両端には、所定の間隔を隔てて対向する一对の側壁板 11 c, 11 d が立設されており、この側壁板 11 c, 11 d によって、駆動軸 15 の両端部が回転可能に軸支 (支持) されている。駆動軸 15 は、伝達ユニット 16 を介して伝達された駆動モータの回転を後述する給紙ローラユニット 31 へ伝達するための回転軸である。また、駆動軸 15 は、載置板 11 a と所定の間隔を隔てて平行に設置されており (図 9 参照)、この駆動軸 15 と載置板 11 a との間に記録紙 P が挿嵌されるのである。

【0039】駆動軸 15 における側壁板 11 d 側の端部には、伝達ユニット 16 が配設されている。伝達ユニット 16 は、駆動モータ (図示せず) の回転 (回転力) を、駆動軸 15 に伝達するものであり、主に、伝達ギヤ 16 a と、伝達プレート 16 b, 16 c と、バネ保持板 16 f と、圧縮ばね部材 16 g とを備えている。上述したように、駆動モータは、連結ギヤ 17～21 を介して伝達ギヤ 16 a に連結されており、伝達ギヤ 16 a に伝達された駆動モータの回転は、伝達ユニット 16 を介して駆動軸 15 に伝達され、駆動軸 15 が回転されるのである。ここで、図 5 を参照して、伝達ユニット 16 の詳細について説明する。

【0040】図 5 (a) は、伝達ユニット 16 の断面図であり、図 5 (b) は、図 5 (a) の V b-V b 線における断面図である。図 5 (a) に示すように、駆動軸 15 の一端部 (図 5 (a) 右側) には、フランジ 15 a、ボス 15 b、バネ保持部 15 c 及びストッパ部 15 d が一体的に形成されている。

【0041】フランジ 15 a は、駆動軸 15 の軸芯と同心状の略円板状に形成されており、このフランジ 15 a の一側面 (図 5 (a) 右側) には、フランジストッパ面 15 a 1 が形成されている。フランジストッパ面 15 a 1 からはボス 15 b が延出されている。このボス 15 b は、図 5 (b) に示すように外周両側面が平面状かつ略平行に切り欠かれており、このため、ボス部 15 b の断面形状は略印籠状に形成されている。

【0042】また、図 5 (a) に示すように、ボス 15 b の反フランジ 15 a 側の端面には、略円柱状のバネ保持部 15 c が延出されている。このバネ保持部 15 c における反ボス 15 b 側の端部にはストッパ部 15 d が外周方向へ突設されており、このストッパ部 15 d におけるボス部 15 b との対向部分にはストッパ面 15 d 1 が形成されている。

【0043】伝達ユニット 16 は、伝達ギヤ 16 a と、伝達プレート 16 b, 16 c と、摩擦シート 16 d, 16 e と、バネ保持板 16 f と、圧縮ばね部材 16 g とを備えている。伝達ギヤ 16 a は樹脂等で形成された平歯車であり、その内周に駆動軸 15 のボス 15 b が回転可能に内包されている。伝達ギヤ 16 a の左右両側面には、不織布で形成された略円環シート状の摩擦シート 1

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6 d, 16 e が周着されている。この摩擦シート 16 d, 16 e が周着された伝達ギヤ 16 a の左右両側には、樹脂等で略円環板状に形成された伝達プレート 16 b, 16 c が配設され、この伝達プレート 16 b, 16 c の内周には駆動軸 15 のボス 15 b が嵌合されている。

【0044】各伝達プレート 16 b, 16 c は、伝達ギヤ 16 a に周着された摩擦シート 16 d, 16 e とそれぞれ当接されており、この各摩擦シート 16 d, 16 e との当接面に断面視略 V 字状の複数の溝が設けられている。各伝達プレート 16 b, 16 c における断面 V 字状の溝は、駆動軸 15 と同心円状に複数形成されており、これらの複数の溝が摩擦シート 16 d, 16 e に各々食い込むことにより、伝達プレート 16 b, 16 c と摩擦シート 16 d, 16 e との面圧を均一化させ、伝達プレート 16 b, 16 c と摩擦シート 16 d, 16 e との当接面間の摩擦抵抗を安定化させている。

【0045】ここで、図 5 (b) に示すように、伝達プレート 16 b, 16 c の内周の形状は、駆動軸 15 のボス 15 b の外周形状に適合した略印籠状に形成されている。このように、伝達プレート 16 b, 16 c の内周形状をボス 15 b の外周形状に適合させることにより、伝達プレート 16 b, 16 c を、駆動軸 15 と一体となって回転させることができるのである。一方、伝達ギヤ 16 a は、その内周 16 a 1 の内径がボス 15 b の外径より若干大きな円形状に形成されており、駆動軸 15 のボス 15 b に対して空転することができる。

【0046】図 5 (a) に示すように、伝達プレート 16 c における反伝達ギヤ 16 a 側には、バネ保持板 16 f と圧縮ばね部材 16 g とが配設されている。バネ保持板 16 f は、伝達プレート 16 c と共に、圧縮ばね部材 16 g を保持するためのものであり、略円環板状に形成されている。バネ保持板 16 f の周縁部の一部は、伝達プレート 16 c 側へ向けて略 L 字状に屈曲されており、この屈曲部分により圧縮ばね部材 16 g のズレを防止している。また、バネ保持板 16 f は、駆動軸 15 のバネ保持部 15 c に突設されるストッパ部 15 d と係合され、そのストッパ部 15 d のストッパ面 15 d 1 によって反伝達プレート 16 c 側 (図 5 (a) の右側) への移動が規制されている。

【0047】伝達プレート 16 c とバネ保持板 16 f との間には、弾性的に圧縮変形された状態で圧縮ばね部材 16 g が配設されており、圧縮ばね部材 16 g の内周には駆動軸 15 のバネ保持部 15 c が貫通されている。圧縮ばね部材 16 g は、伝達ギヤ 16 a を駆動軸 15 のフランジ 15 a へ向けて付勢するものであり、この圧縮ばね部材 16 g の左右両端は伝達プレート 16 c とバネ保持板 16 f とにそれぞれ当接されている。圧縮ばね部材 16 g は、その弾性復元力により伝達プレート 16 c をフランジ 15 a 側へ付勢し、その付勢力によって、伝達

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ギヤ 16 a に周着された摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c とが圧接されるのである。かかる圧接により、摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c との当接面間に摩擦力を付与することができるのである。尚、本実施例では、圧縮ばね部材 16 g により伝達プレート 16 b, 16 c に加えられる 1 平方センチメートル辺りの圧力が 1.5 kgf とされている。

【0048】よって、伝達ギヤ 16 a に伝達される回転力が摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c との当接面間に生じる摩擦力よりも小さい場合には、この摩擦力を介して、伝達プレート 16 b, 16 c が伝達ギヤ 16 a と一体となって回転される。伝達プレート 16 b, 16 c の内周には駆動軸 15 におけるボス 15 b が嵌合されるので、駆動軸 15 が伝達ギヤ 16 a 及び伝達プレート 16 b, 16 c と一体となって回転されるのである。一方、伝達ギヤ 16 a に伝達される回転力が摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c との当接面間に生じる摩擦力よりも大きい場合には、摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c との当接面同士が滑動されるので、伝達ギヤ 16 a が駆動軸 15 に対して相対的に空転され、この空転により駆動軸 15 に伝達される回転力が制限されるのである。

【0049】図 4 に戻って説明する。駆動軸 15 の軸方向略中央部には、給紙ローラユニット 31 が軸支されている。給紙ローラユニット 31 は、載置板 15 a に載置される記録紙 P を案内板 11 b 側に搬送するものであり、駆動軸 15 の軸方向略中央に配設されるホルダ部材 32 を備えている。

【0050】ホルダ部材 32 の一側面 (図 4 の左側) からは、略円筒状に形成されたバネ巻回部 32 a 1 が駆動軸 15 を内包しつつ延出されている。バネ巻回部 32 a 1 は、ホルダ部材 32 と一体に形成されており、バネ巻回部 32 a 1 の内周には、駆動軸 15 が回転可能に内包されている。バネ巻回部 32 a 1 の外周には補助ばね部材 39 が巻回されており、この補助ばね部材 39 の一端は、ネジ 40 によってホルダ部材 32 に螺着されている。

【0051】次に、図 6 から図 9 を参照して、給紙ローラユニット 31 の詳細について説明する。図 6 は、給紙ローラユニット 31 の内部構造を示す断面図であり、図中では、駆動軸 15 および補助ばね部材 39 の一部の図示を省略している。給紙ローラユニット 31 は、駆動軸 15 の回転によって給紙ローラ 37 を駆動し、載置板 11 a に載置される記録紙 P を案内板 11 b 側に搬送するためのものである。

【0052】図 6 に示すように、給紙ローラユニット 31 は、主に、断面視略矩形形状のホルダ部材 32 と、駆動ギヤ 33 と、アーム部材 34 と、クラッチギヤ 35 と、

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抵抗部材 36 と、給紙ローラ 37 と、間接ギヤ 38 とを備えている。これらの各部材 32 ～ 36, 38 は、駆動軸 15 と給紙ローラ 37 の間に設けられ、この駆動軸 15 の回転を給紙ローラ 37 に伝達するためのものである。

【0053】ホルダ部材 32 は、給紙ローラユニット 31 の骨格を成すものであり、かかるホルダ部材 32 の底部（図 6 奥側）、左側部（図 6 左側）及び上部（図 6 上側）を構成する下部フレーム 32a と、ホルダ部材 32 の前部（図 6 の手前側）及び右側部（図 6 の右側）を構成する上部フレーム 32b とを備えている。

【0054】下部フレーム 32a は、駆動軸 15 に対して揺動可能に支持されており、下部フレーム 32a の左側方からは、円筒状に形成されたバネ巻回部 32a1 が駆動軸 15 を内包しつつ延出されている。このバネ巻回部 32a1 の先端部には、バネ係止突起 32a2 が突設され、補助ばね部材 39 の脱落を防止している。

【0055】下部フレーム 32a の左内部にはマウント部 32a3 が配設されており、このマウント部 32a3 には、下部フレーム 32a と上部フレーム 32b とをネジ 40 によりねじ止めするためのネジ穴 32a4 が凹設されている。また、ホルダ部材 32 の右側上部には、駆動軸 15 と一体となって回転する駆動ギヤ 33 が駆動軸 15 を内包しつつ配設されており、この駆動ギヤ 33 の左側には、アーム部材 34 が配設されている。

【0056】アーム部材 34 は、駆動軸 15 が回転可能に挿嵌されるカラー部 34a と、そのカラー部 34a から外方へ延出されるアーム部 34b とを備えている。アーム部 34b の延出部分の先端部には、駆動ギヤ 33 に歯合されるクラッチギヤ 35 が回転可能に軸着されている。また、アーム部 34b とクラッチギヤ 35 との間には、駆動ギヤ 33 の回転に連動してアーム部材 34 を揺動させるため、クラッチギヤ 35 に摩擦抵抗（負荷）を付与する抵抗部材 36 が設けられている。

【0057】ホルダ部材 32 の下部（図 6 の下側）には、記録紙 P を搬送するための略円柱状の給紙ローラ 37 が配設されている。給紙ローラ 37 は、その軸方向両端に略円柱状のローラ軸 37a, 37a が突設されており、このローラ軸 37a, 37a によりホルダ部材 32 に回転可能に軸着されている。また、給紙ローラ 37 は、記録紙 P に当接するローラ部 37b と、そのローラ部 37b に駆動軸 15 の回転を伝達するためのギヤ部 37c とを備えている。ローラ部 37b は、その外周面にシリコンゴムなどの表面摩擦係数の大きな材料が周着されており、記録紙 P の表面に接触した場合に滑って空転することが防止されている。また、クラッチギヤ 35 とギヤ部 37c との間部分には、駆動軸 15 の回転をローラ部 37b へ伝達するための間接ギヤ 38 が配設されており、この間接ギヤ 38 は、上部フレーム 32b に突設された軸部 32b1 によって回転可能に軸支されてい

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る。

【0058】図 7 (a) は、給紙ローラユニット 31 の部分拡大断面図であり、図 7 (b) は、図 7 (a) の V I I - V I I 線における断面図である。尚、図 7 では、バネ巻回部 32a1 の外周面に巻回される補助ばね部材 39 の図示を省略している。

【0059】図 7 (a) に示すように、駆動軸 15 は、給紙ローラユニット 31 のホルダ部材 32 の幅方向（図 7 (a) 左右方向）に貫通されている。この駆動軸 15 は、図 7 (b) に示すように、外周面の一部が略平面状に切り欠かれて断面略 D 字状に形成されており、駆動ギヤ 33 を係止するための係止面 15e, 15f が形成されている。

【0060】図 7 (a) に示すように、駆動軸 15 は、駆動ギヤ 33 の内周に内包されている。駆動ギヤ 33 は、駆動軸 15 を内包するカラー部 33a と、そのカラー部 33a からホルダ部材 32 の右側外方へ延出される係合フック 33b とが一体的に形成されている。駆動ギヤ 33 のカラー部 33a は、略円筒状に形成されており、上部フレーム 32b の右側部に回転可能に嵌入されている。

【0061】駆動ギヤ 33 におけるカラー部 33a の右端面（図 7 右側）は、駆動軸 15 に形成された係止面 15f と当接されている。また、カラー部 33a の右端面（図 7 (a) 右側）には、係合フック 33b がホルダ部材 32 の外方へ向けて延出されている。この係合フック 33b は、その先端に鉤状の突起が形成されており、かかる突起が駆動軸 15 の外周に凹設された係合部 15g に係合されている。

【0062】このように、駆動ギヤ 33 は、カラー部 33a の右端面が駆動軸 15 の係止面 15f と当接され、且つ、係合フック 33b の先端が駆動軸 15 の係合部 15g と係合されることにより、駆動軸 15 の軸方向に対して位置決めされて固定されるのである。更に、駆動ギヤ 33 は、ギヤ部 33 の内周の形状が係止面 15e が形成される駆動軸 15 の外周形状に適合されているので、駆動軸 15 と一体となって回転することができるのである。

【0063】駆動ギヤ 33 における反係合フック 33b 側の端部には、アーム部材 34 が隣接して配設されている。アーム部材 34 の駆動ギヤ 33 側の端部には、略中空円筒状のカラー部 34a が駆動軸 15 を内包しつつ配設されている。カラー部 34a の内周は、駆動軸 15 の外径より若干大きく形成されている。よって、駆動軸 15 は、このカラー部 34a の内周に回転可能に内包されている。カラー部 34a の外周（図 7 の下方向）には、アーム部 34b が外方へ延出されており、このアーム部 34b の先端部には、駆動ギヤ 33 と歯合するクラッチギヤ 35 が回転可能に軸支されている。

【0064】アーム部 34b とクラッチギヤ 35 との対

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向面間には、抵抗部材 36 が設けられている。抵抗部材 36 は、クラッチギヤ 35 の側面を押圧することにより抵抗部材 36 とクラッチギヤ 35 との間に生じる摩擦抵抗（負荷）を付与して、駆動ギヤ 33 の回転に連動させてアーム部材 34 を揺動させるためのものである。抵抗部材 36 は、金属板などの弾性部材 36 により形成されている。抵抗部材 36 は、弾性変形させた状態でアーム部 34 b とクラッチギヤ 35 との対向面間に嵌入され、アーム部 34 b に取付されている。この抵抗部材 36 は、その弾性復元力によりクラッチギヤ 35 の側面を付勢し、その付勢力によってクラッチギヤ 35 に摩擦抵抗を付与している。

【0065】このため、駆動ギヤ 33 から伝達される回転力が抵抗部材 36 による摩擦抵抗より小さい場合に、クラッチギヤ 35 は、駆動ギヤ 33 によって回転されることなく、アーム部材 34 のアーム部 34 b とともに、駆動ギヤ 33 の回転に連動して駆動軸 15 を揺動中心に揺動されるのである。一方、駆動ギヤ 33 から伝達される回転力が抵抗部材 36 による摩擦抵抗より大きい場合に、クラッチギヤ 35 は、抵抗部材 36 による摩擦抵抗に抗して駆動ギヤ 33 により回転されるのである。

【0066】また、アーム部材 34 のカラー部 34 a の両端面は、下部フレーム 32 a の左側内面および駆動ギヤ 33 の歯先部分の左側面にそれぞれ当接されており、その駆動ギヤ 33 の歯先部分の右側面は、上部フレーム 32 b の右側内面に当接されている。しかも、駆動ギヤ 33 は、係合フック 33 b の係合部 15 g への係合およびカラー部 33 a の係止面 15 f との当接によって、駆動軸 15 の軸方向に対して位置決めされているので、給紙ローラユニット 31 自体が駆動軸 15 の軸方向略中央に位置決めされて固定されるのである。

【0067】図 8 は、給紙ローラユニット 31 におけるホルダ部材 32 の側断面図である。図 8 に示すように、下部フレーム 32 a の底面上側には、断面矩形棒状のマウント部 32 a 3 が設けられている。マウント部 32 a 3 は、下部フレーム 32 a に合致された上部フレーム 32 b を支保するものであり、このマウント部 32 a 3 の上面（図 8 の上側）が上部フレーム 32 b と当接されている。マウント部 32 a 3 における上部フレーム 32 b との当接面には、ねじ 40 が螺入可能なネジ穴 32 a 4 が凹設されており、このネジ穴 32 a 4 の内周面にはねじが螺刻されている。

【0068】一方、上部フレーム 32 b におけるマウント部 32 a 3 との当接部分には、略円形状の通穴 41 がマウント部 32 a 3 のネジ穴 32 a 4 と対応する位置に穿設されている。この通穴 41 には木ねじ等で構成されたネジ 40 が挿入されており、このネジ 40 は下部フレーム 32 a のネジ穴 32 a 4 に螺入されている。このネジ 40 のネジ穴 32 a 4 への螺入によって、上部フレーム 32 b が下部フレーム 32 a にねじ止めされている。

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【0069】また、ネジ 40 の頭部と上部フレーム 32 b との間には、上述した補助ばね部材 39 の一端が挟持され、かかる補助ばね部材 39 が下部フレーム 32 a 及び上部フレーム 32 b に共締めされている。よって、補助ばね部材 39 の一端を給紙ローラユニット 31 に取付する作業を、下部フレーム 32 a と上部フレーム 32 b との結合する作業とともに一括して行うことができる。しかも、下部フレーム 32 a に上部フレーム 32 b をねじ止めるネジ 41 によって、補助ばね部材 39 がホルダ部材 32 に取付されるので、補助ばね部材 39 をねじ止めるねじを別途用意する必要がないのである。

【0070】図 9 は、図 4 の I X - I X 線における断面図であり、図中の矢印 X は、記録紙 P の搬送方向を示している。図 9 に示すように、記録紙挿入部 8 を構成する載置板 11 a と挿入部カバー 12 との対向面間には、上記の給紙ローラユニット 31 が駆動軸 15 により支持されており、この給紙ローラユニット 31 のバネ巻回部 32 a 1 には上述した補助ばね部材 39 が巻回されている。補助ばね部材 39 の一端は、ネジ 40 によりホルダ部材 32 に螺着されており、補助ばね部材 39 の他端は、弾性的に撓み変形された状態で挿入部カバー 12 の収容部 12 a の内側上面に当接されつつ係止されている。このため、補助ばね部材 39 によって、給紙ローラユニット 31 は、駆動軸 15 回りに載置板 11 a 側へ付勢されるので、給紙ローラユニット 31 の給紙ローラ 37 を載置板 11 a 側へ押し付けて、記録紙 P に密着させることができるのである。

【0071】また、給紙ローラユニット 31 における載置板 11 a との非対向面側には、上述した挿入部カバー 12 が設けられており、この挿入部カバー 12 における給紙ローラユニット 31 と対向部分には凹状の空間である収容部 12 a が凹設されている。よって、給紙ローラユニット 31 が駆動軸 15 回りに挿入部カバー 12 側へ揺動する場合には、収容部 12 a 内に給紙ローラユニット 31 を収容することができる。このため、給紙装置 10 における記録紙 P の搬送方向（図 9 左右方向）寸法を小型化することができるのである。

【0072】図 10 (a) は、給紙ローラ 37 が載置板 11 a に当接された状態における給紙ローラユニット 31 の側断面図であり、図 10 (b) は、給紙ローラ 37 が載置板 11 a から離間された状態における給紙ローラユニット 31 の側断面図である。なお、図 10 中ではクラッチギヤ 35 及び間接ギヤ 38 のピッチ円を一点鎖線で図示し、各ギヤ 35, 38 のギヤ歯の図示を省略する。

【0073】図 10 (a), (b) に示すように、アーム部材 34 のアーム部 34 b は、側面視略 T 字状に形成されている。具体的には、アーム部材 34 のカラー部 34 a から延出されるアーム部 34 b の先端部には、クラッチギヤ 35 が回動可能に軸支されると共に、そのクラ

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ッチギヤ 35 の軸支部分からクラッチギヤ 35 の半径方向外側に向かってストッパ部 34 b 1, 34 b 2 が直線状にそれぞれ延出されている。アーム部材 34 のアーム部 34 b が時計方向へ揺動する場合、ストッパ部 34 b 1 の先端部は、図 10 の (a) に示す下部フレーム 32 a の底面 32 a 5 に当接される。一方、アーム部材 34 のアーム部 34 b が反時計方向へ揺動する場合、ストッパ部 34 b 2 の先端部は、図 10 の (b) に示す上部フレーム 32 b の上面 32 b 2 に当接される。

【0074】ストッパ部 34 b 1, 34 b 2 は、クラッチギヤ 35 の歯先円より更に外方へそれぞれ延出されている。よって、ストッパ部 34 b 1, 34 b 2 が、それぞれ各面 32 a 5, 32 b 2 へ当接される場合には、クラッチギヤ 35 の歯先とフレーム 32 との接触を防止して、クラッチギヤ 35 の歯先の損傷を防止することができるのである。

【0075】また、図 10 (a) に示すクラッチギヤ 35 がアーム部材 34 によって反時計方向へ揺動され、図 10 (b) に示す位置に移動すれば、クラッチギヤ 35 と間接ギヤ 38 とを離間させて、各ギヤ 35, 38 の歯合状態を解除することができる。一方、図 10 (b) に示すクラッチギヤ 35 がアーム部材 34 によって時計方向へ揺動され、図 10 (a) に示す位置に移動すれば、クラッチギヤ 35 と間接ギヤ 38 とを歯合させて、クラッチギヤ 35 の回転を間接ギヤ 38 に伝達して、給紙ローラ 37 を回転させることができる。

【0076】次に、上記のように構成された給紙ローラユニット 31 の動作について説明する。伝達ユニット 16 を介して駆動軸 15 が図 10 (b) の時計方向へ回転されると、その駆動軸 15 と一体となって駆動ギヤ 33 が図 10 (b) の時計方向へ回転される。駆動ギヤ 33 の回転は、その駆動ギヤ 33 に歯合されたクラッチギヤ 35 に伝達される。ここで、クラッチギヤ 35 は、抵抗部材 36 による摩擦抵抗によって、アーム部材 34 のアーム部 34 b と共に、駆動ギヤ 33 の回転に連動して駆動軸 15 を揺動中心に間接ギヤ 38 側 (図 10 (b) の時計方向) へ揺動される。この揺動に伴って、クラッチギヤ 35 は、図 10 (a) に示す位置に移動して間接ギヤ 38 と歯合され、その一方で、アーム部材 34 のストッパ部 34 b 1 の先端部が下部フレーム 32 a の底面 32 a 5 に当接される。このストッパ部 34 b 1 と底面 32 a 5 との当接により、クラッチギヤ 35 の間接ギヤ 38 側への揺動動作が制限されるので、クラッチギヤ 35 と間接ギヤ 38 とを常に所定の位置で歯合させることができ、クラッチギヤ 35 の回転力を間接ギヤ 38 へ円滑に伝達することができるのである。

【0077】ストッパ部 34 b 1 が下部フレーム 32 a 5 に当接した後、駆動軸 15 が更に回転されると、駆動軸 15 と一体となって回転される駆動ギヤ 33 により、クラッチギヤ 35 が抵抗部材 36 による摩擦抵抗に抗し

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て回転される。クラッチギヤ 35 の回転は、クラッチギヤ 35 に歯合される間接ギヤ 38 へ伝達される。更に、間接ギヤ 38 に伝達された回転は、給紙ローラ 37 のギヤ部 37 c に伝達され、その結果、ローラ部 37 b が図 10 (a) の反時計方向へ回転され、この回転により記録紙 P が搬送方向 (図 10 矢印 X 方向) へ搬送されるのである。

【0078】クラッチギヤ 35 は、間接ギヤ 38 に対して反載置板 11 a 側 (図 10 (a) の右上側) に位置されている。このため、間接ギヤ 38 と歯合された後、クラッチギヤ 35 が駆動ギヤ 33 により回転されると、この駆動ギヤ 33 の回転力によりアーム部材 34 が下部フレーム 32 a 側へ更に揺動しようとして、下部フレーム 32 a がアーム部材 34 のストッパ部 34 b 1 により載置板 11 a 側へ向けて押動される。この押動によって、フレーム 32 に軸支される給紙ローラ 37 は載置板 11 a 側へ押し付けられるので、記録紙 P が給紙ローラ 37 によって搬送される場合に、かかる給紙ローラ 37 が記録紙 P から離間することを防止して、記録紙 P の搬送を円滑に行うことができるのである。

【0079】一方、駆動軸 15 が図 10 (a) の反時計方向へ回転されると、その駆動軸 15 と一体となって駆動ギヤ 33 が図 10 (a) の反時計方向へ回転される。駆動ギヤ 33 の回転は、その駆動ギヤ 33 に歯合されたクラッチギヤ 35 に伝達される。ここで、クラッチギヤ 35 は、抵抗部材 36 による摩擦抵抗によって、アーム部材 34 のアーム部 34 b と共に、駆動ギヤ 33 の回転に連動して駆動軸 15 を揺動中心に図 10 (a) の反時計方向へ揺動される。この揺動に伴って、クラッチギヤ 35 は、間接ギヤ 38 から離間されて、図 10 (b) に示す位置に移動される。クラッチギヤ 35 が間接ギヤ 38 から離間すると、両ギヤ 35, 38 の歯合状態が解除されるので、給紙ローラ 37 が図 10 (b) の時計方向へ向けて空転可能とされる。よって、記録紙 P を記録紙挿嵌部 8 から取り出す際には、ローラ部 37 b と載置板 11 a との間に挿嵌される記録紙 P を容易に抜き出すことができるのである。

【0080】また、アーム部材 34 の反時計方向への揺動に伴って、アーム部材 34 のストッパ部 34 b 2 の先端部は、上部フレーム 32 b の上面 32 b 2 に当接される。この当接により、アーム部材 34 及びクラッチギヤ 35 の反時計方向へ向けた揺動動作が制限される。かかる状態で、駆動軸 15 が反時計回りに更に回転されると、駆動ギヤ 33 の回転力によりアーム部材 34 がストッパ部 34 b 2 により上部フレーム 32 b を上方へ押動する。この押動によって、上部フレーム 32 b は、駆動軸 15 を回転中心として反時計回りへ揺動されるので、図 10 (b) に示すように、給紙ローラ 37 を載置板 11 a から離間させることができ、新たな記録紙 P を給紙ローラ 37 b と載置板 11 a との間へ容易に差し込むこ

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とができるのである。

【0081】以上説明したように、本実施例の給紙装置 10 によれば、伝達ユニット 16 は、伝達ギヤ 16 a に伝達される回転力が摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c との当接面間に生じる摩擦力よりも大きい場合に、摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c との当接面同士が滑動されるので、伝達ギヤ 16 a を駆動軸 15 に対して相対的に空転させて、この空転により駆動軸 15 に伝達される回転力を制限することができる。

【0082】例えば、紙詰まり等によって後述する駆動ギヤ 33、クラッチギヤ 35、間接ギヤ 38、給紙ローラ 37 および駆動軸 15 の回転負荷が増大すると、駆動モータは伝達ギヤ 16 a に伝達する回転力を増して駆動軸 15 を回転させようとするが、かかる回転力が摩擦シート 16 d, 16 e と伝達プレート 16 b, 16 c との当接面間に生じる摩擦力より大きくなると、伝達ギヤ 16 a は駆動軸 15 に対して空転されるので、かかる伝達ギヤ 16 a により駆動軸 15 に伝達される回転力を制限することができる。

【0083】このため、駆動軸 15、各ギヤ 33, 35, 38 及び給紙ローラ 37 に過大な回転力が加わることを防止して、これらの各部材 15, 33, 35, 37, 38 の破損することを防止することができる。しかも、伝達ギヤ 16 a を空転させることによって、駆動モータや連結ギヤ 17 ~ 21 に過負荷が加わることを防止できるので、かかる駆動モータの異常な駆動状態で生じる騒音や、駆動モータ自体の故障を防止することができるのである。

【0084】以上、実施例に基づき本発明を説明したが、本発明は上記実施例に何ら限定されるものではなく、本発明の趣旨を逸脱しない範囲内で種々の改良変形が可能であることは容易に推察できるものである。

【0085】

【発明の効果】請求項 1 記載の画像形成装置によれば、駆動軸の軸方向一端部を回転可能に内包する伝達部材は、圧接部材により所定の摩擦力で駆動軸に圧接され、その摩擦力を介して駆動軸に回転力を伝達するので、伝達部材に加わる回転力が圧接部材による所定の摩擦力を越える場合には、伝達部材を駆動軸に対して滑動させて、伝達部材を駆動軸に対して空転させることができる。よって、駆動装置により伝達部材に伝達される回転力を、圧接部材による所定の摩擦力より小さな力に制限することができるという効果がある。

【0086】例えば、紙詰まり等によって給紙ローラや駆動軸の回転負荷が増大すると、駆動装置は伝達部材に伝達する回転力を増して駆動軸を回転させようとするが、かかる回転力が圧接部材による所定の摩擦力を越えると、伝達部材は駆動軸に対して空転されるので、かかる伝達部材により駆動軸に伝達される回転力を制限する

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ことができる。このため、駆動軸や給紙ローラに過大な回転力が加わることを防止して、これらの駆動軸や給紙ローラの破損することを防止することができるという効果がある。

【0087】しかも、伝達部材を空転させることによって、駆動装置に過負荷が加わることを防止できるので、かかる駆動装置の異常な駆動状態で生じる騒音や、駆動装置自体の故障を防止することができるという効果がある。

10 【0088】請求項 2 記載の給紙装置によれば、請求項 1 記載の給紙装置の奏する効果に加え、付勢部材の付勢力によって、伝達部材の側面と駆動軸の当接面とは圧接されるので、その圧接により伝達部材の側面と駆動軸の当接面との間に摩擦力を付与することができる。よって、かかる摩擦力より小さな回転力が伝達部材に加わる場合には、その摩擦力を介して伝達部材の回転を駆動軸に伝達することができる一方、かかる摩擦力を越える回転力が伝達部材に加わる場合には、伝達部材の側面を駆動軸の当接面に対して滑動させて、伝達部材を駆動軸の軸方向一端部で空転させることができるという効果がある。

20 【0089】請求項 3 記載の給紙装置によれば、請求項 1 または 2 に記載の給紙装置の奏する効果に加え、用紙の搬送が完了した後に、駆動軸が他の方向へ回転されると、クラッチ部材によって駆動軸と給紙ローラとの連結状態が解除されるので、この連結状態の解除により給紙ローラを用紙の反搬送方向へ空転可能な状態とすることができる。よって、用紙保持部材に載置された用紙を反搬送方向へ引き出す場合に、かかる用紙を、用紙保持部材と給紙ローラとの間から反搬送方向へ容易に引き出すことができるという効果がある。

30 【0090】請求項 4 記載の給紙装置によれば、請求項 3 記載の給紙装置の奏する効果に加え、駆動軸が他の方向へ回転される場合に、抵抗部材により負荷が付与されたクラッチギヤは、アーム部材の延出部と共に駆動軸及び第 2 ギヤの回転に連動して、駆動軸を揺動中心に第 1 ギヤ側とは反対側へ揺動することができる。この揺動により、クラッチギヤは、第 1 ギヤから離間され歯合状態が解除されるので、第 1 ギヤに連結される給紙ローラを、用紙の反搬送方向へ向けて空転可能な状態にすることができるという効果がある。

40 【0091】請求項 5 記載の給紙装置によれば、請求項 1 または 2 に記載の給紙装置の奏する効果に加え、例えば、用紙の搬送が完了した後に、駆動軸を他の方向へ回転すると、クラッチ部材によって、駆動軸の回転力をホルダ部材に伝達して、そのホルダ部材を用紙保持部材側とは反対側へ押動し、給紙ローラを用紙保持部材に載置される用紙から離間させることができる。よって、用紙の搬送が完了した後は、新たな用紙を給紙ローラと用紙保持部材との間へ差し込むことができるという効果があ

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る。

【0092】請求項6記載の給紙装置によれば、請求項5記載の給紙装置の奏する効果に加え、駆動軸が他の方向へ回転される場合に、抵抗部材により負荷が付与されたクラッチギヤは、アーム部材の延出部と共に駆動軸及び第2ギヤの回転に連動して、駆動軸を揺動中心に第1ギヤ側とは反対側へ揺動することができる。この揺動に伴って、ホルダ部材のホルダフレームは、アーム部材により第1ギヤ側とは反対側へ押動されるので、この押動により給紙ローラを用紙保持部材に載置される用紙から離間させることができるという効果がある。

【0093】請求項7記載の給紙装置によれば、請求項4または6に記載の給紙装置の奏する効果に加え、給紙ローラに連結される第1ギヤは、クラッチギヤに対し用紙保持部材側に設けられるので、クラッチギヤが歯合された状態で用紙保持部材側へ押動され、この押動により給紙ローラを用紙保持部材側へ押し付けることができるという効果がある。よって、給紙ローラにより用紙が搬送される場合、即ち、クラッチギヤと歯合された第1ギヤにより給紙ローラが用紙の搬送方向へ回転される場合に、給紙ローラが用紙から離間することを防止して、用紙の搬送を円滑に行うことができるという効果がある。

【0094】請求項8記載の給紙装置によれば、請求項4または6に記載の給紙装置の奏する効果に加え、クラッチギヤを軸支するアーム部材は、制限部材によって第1ギヤ側への揺動動作が制限されるので、クラッチギヤが第1ギヤと歯合された場合に、かかるクラッチギヤと第1ギヤとを常に所定の位置で歯合させることができ、その結果、クラッチギヤにより第1ギヤに伝達される回転力の変動を抑制して、所望の回転力の円滑に伝達することができるという効果がある。

【図面の簡単な説明】

【図1】本発明の一実施例である給紙装置を搭載した多機能周辺装置の外観斜視図である。

【図2】多機能周辺装置に搭載される給紙装置の外観斜視図である。

【図3】給紙装置の側面図である。

【図4】図4は、図2のIV-IV線における断面図である。

【図5】(a)は、伝達ユニット16の断面図であり、(b)は、(a)のVb-Vb線における断面図である。

【図6】給紙ローラユニットの内部構造を示す断面図である。

【図7】(a)は、給紙ローラユニットの部分拡大断面図であり、(b)は、(a)のVII-VII線におけ

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る断面図である。

【図8】給紙ローラユニットにおけるホルダ部材の側断面図である。

【図9】図4のIX-IX線における断面図である。

【図10】(a)は、給紙ローラが載置板に当接された状態における給紙ローラユニットの側断面図であり、(b)は、給紙ローラが載置板から離間された状態における給紙ローラユニットの側断面図である。

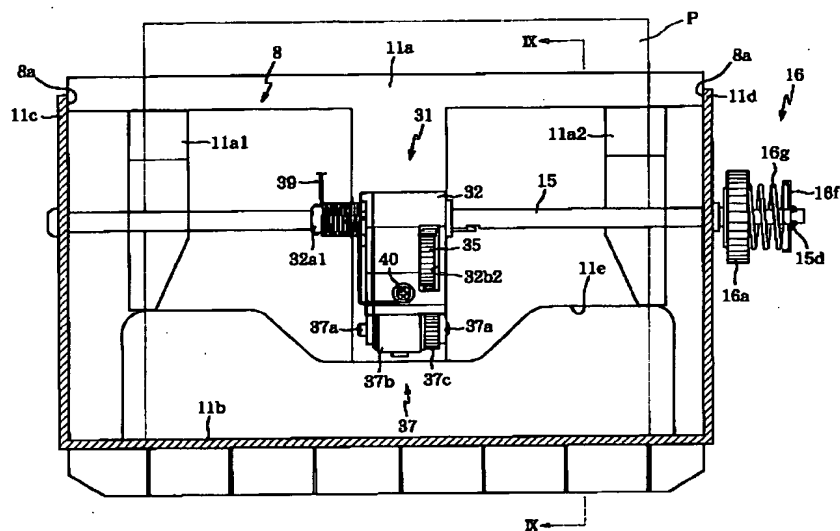
【符号の説明】

10	給紙装置
11	挿嵌部フレーム（フレーム体）
11a	載置板（用紙保持板）
15	駆動軸
15a1	フランジストッパ面（当接面）
16a	伝達ギヤ（伝達部材の一部）
16b, 16c	伝達プレート（圧接部材の一部）
16d, 16e	摩擦シート（伝達部材の一部）
16g	圧縮ばね部材（付勢部材、圧接部材の一部）
17~21	連結ギヤ（駆動装置の一部）
32	ホルダ部材
32a5	底面（制限部材）
32b	上部フレーム（ホルダフレーム）
33	駆動ギヤ（第2ギヤ、クラッチ部材の一部）
34	アーム部材（アーム部材、クラッチ部材の一部）
34a	カラー部（アーム部材のカラー部）
34b	アーム部（アーム部材の延出部の一部）
34b1, 34b2	ストッパ部（アーム部材の延出部の一部）
35	クラッチギヤ（クラッチギヤ、クラッチ部材の一部）
36	抵抗部材（抵抗部材、クラッチ部材の一部）
37	給紙ローラ
37c	ギヤ部（第1ギヤの一部、クラッチ部材の一部）
38	間接ギヤ（第1ギヤの一部、クラッチ部材の一部）
P	記録紙（用紙）

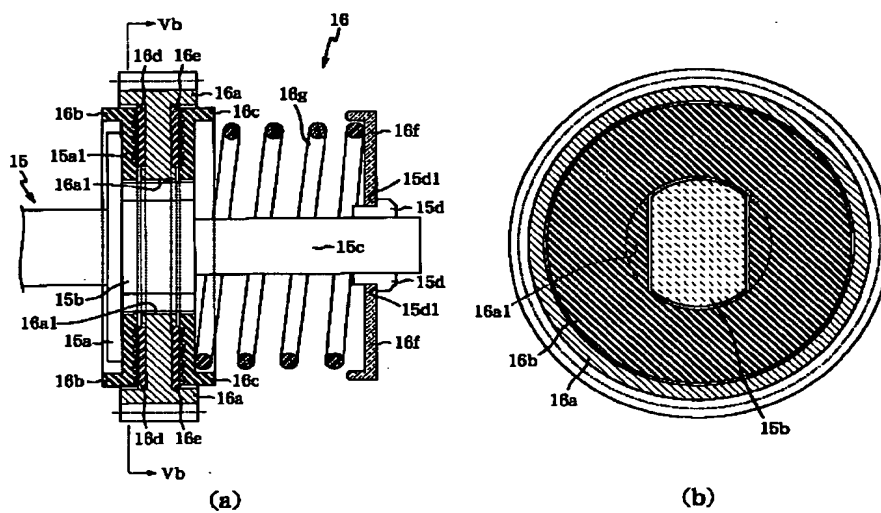
特開 2002-60068
(P2002-60068A)

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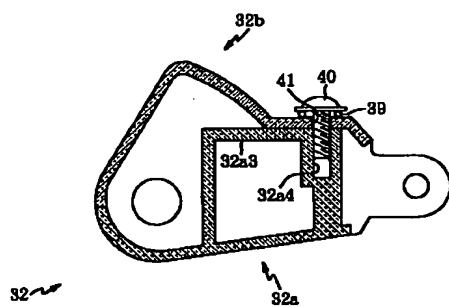
【図 4】



【図5】



【图 8】



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CLAIMS

[Claim(s)]

[Claim 1] The form attachment component holding a form The feed roller which conveys the form laid in the form attachment component the electrode holder supported to revolve possible [rotation of the feed roller] -- a member The driving shaft connected with the aforementioned feed roller directly or indirectly while supporting the electrode-holder member The driving gear which gives turning effort to the aforementioned driving shaft supported to revolve by the frame without front fork supported to revolve possible [rotation of the shaft-orientations both ends of the driving shaft], and its frame without front fork It is feed equipment equipped with the above, and is characterized by having the transfer member which the turning effort by the aforementioned driving gear is delivered while connoting the shaft-orientations end section of the aforementioned driving shaft possible [rotation], and the pressure-welding member which carries out the pressure welding of the transfer member to the aforementioned driving shaft with predetermined frictional force.

[Claim 2] while the aforementioned driving shaft adjoins the aforementioned transfer member and is prepared in the shaft-orientations end section of the driving shaft -- the transfer -- the feed equipment according to claim 1 characterized by having had the contact side contacted with the side of a member, and equipping the aforementioned pressure-welding member with the energization member which turns the aforementioned transfer member to the aforementioned contact side, and energizes it

[Claim 3] The aforementioned electrode-holder member is feed equipment according to claim 1 or 2 characterized by having the clutch member of which the connection state of the driving shaft and the aforementioned feed roller is canceled when the driving shaft and the aforementioned feed roller are connected when the aforementioned driving shaft which supports the electrode-holder member rotates in the direction of 1, and the aforementioned driving shaft rotates in other directions between the aforementioned driving shaft and the aforementioned feed roller.

[Claim 4] Feed equipment according to claim 3 characterized by providing the following The aforementioned clutch member is the 1st gear connected with the aforementioned feed roller. The 2nd gear which it estranges from the 1st gear, is prepared in the aforementioned driving shaft, and is rotated united with the driving shaft the arm which has the extension section which extends to the method of outside from the color section fitted in possible [rotation of the aforementioned driving shaft in which the 2nd gear is prepared], and its color section, and is formed in the 1st gear side of the above, or its opposite side at a rockable -- a member the arm -- the resistance which gives a load to the aforementioned clutch gear in order to make it rotation of the clutch gear which is supported to revolve by the extension section of a member possible [rotation] and is engaged by the 2nd gear of the above, and the 2nd gear of the above engaged by the clutch gear interlocked with and to make the aforementioned arm member rock -- a member

[Claim 5] The aforementioned electrode-holder member is supported possible [rotation] to the aforementioned driving shaft. When the aforementioned driving shaft rotates in the direction of 1, while connecting the driving shaft and the aforementioned feed roller The clutch member which transmits the turning effort of the driving shaft to the aforementioned electrode-holder member, and pushes the

electrode-holder member to an opposite side with the aforementioned form attachment component side when the aforementioned driving shaft rotates in other directions between the aforementioned driving shaft and the aforementioned feed roller Feed equipment according to claim 1 or 2 characterized by having.

[Claim 6] Feed equipment according to claim 5 characterized by providing the following The aforementioned clutch member is the 1st gear connected with the aforementioned feed roller. The 2nd gear which it estranges from the 1st gear, is prepared in the aforementioned driving shaft, and is rotated united with the driving shaft the arm which has the extension section which extends to the method of outside from the color section fitted in possible [rotation of the aforementioned driving shaft in which the 2nd gear is prepared], and its color section, and is formed in the 1st gear side of the above, or its opposite side at a rockable -- a member the arm -- the electrode-holder frame with which the 1st gear side of the above is pushed by the aforementioned arm member to an opposite side while are prepared in the resistance member which gives a load to the aforementioned clutch gear, and the aforementioned electrode-holder member and supporting the aforementioned feed roller to revolve, in order make it rotation of the clutch gear which is supported to revolve by the extension section of a member possible and is engaged by the 2nd gear of the above, and the 2nd gear of the above which are engaged by [Claim 7] the 1st gear of the above -- the aforementioned arm -- it prepares in the aforementioned form attachment component side to the aforementioned clutch gear supported to revolve by the extension section of a member -- having -- the aforementioned arm -- the feed equipment according to claim 4 or 6 characterized by being the aforementioned clutch gear and the thing to engage by rocking the extension section of a member to the form attachment component side

[Claim 8] the case where, as for the aforementioned electrode-holder member, the aforementioned clutch gear is engaged by the 1st gear of the above -- the aforementioned arm -- the feed equipment according to claim 4 or 6 characterized by having the limit member which restricts rocking operation by the side of the 1st gear of the above of a member

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention suppresses an excessive turning effort especially transmitted to a feed roller from a driving gear about the feed equipment used for image formation equipments, such as a copying machine, a printer, and facsimile, and relates to the feed equipment which can prevent breakage and failure of this feed roller and driving gear.

[0002]

[Description of the Prior Art] There are some which are constituted so that the recording paper may be conveyed in the predetermined conveyance direction in the feed equipment used for facsimile etc. by making a feed roller contact the upper surface of two or more recording papers by which the laminating was carried out, and rotating the feed roller in the conveyance direction of the recording paper.

Generally with this kind of feed equipment, it has the feed roller which conveys the recording paper, the motor which generates turning effort, and two or more gears which transmit the turning effort of the motor to a feed roller. According to this feed equipment, the turning effort of a motor is transmitted to a feed roller by two or more gears, a feed roller rotates in the conveyance direction of the recording paper, and the recording paper is conveyed by this transfer.

[0003]

[Problem(s) to be Solved by the Invention] However, with above feed equipment, since a motor and a feed roller are always connected through two or more gears, even if rotation of a feed roller is inhibited by the paper jam etc. or the rotational resistance of a feed roller increases, the turning effort of a motor will continue being transmitted to a feed roller or two or more gears. For this reason, the excessive rotation load acted on a feed roller or two or more gears, and there was a trouble that these feeding roller and a gear will be damaged. Moreover, when a motor also had the rotation inhibited, it did not drive as the driving pulse signal, but there was a trouble that the noise resulting from repeating rotation of the right inversion direction will occur, or the motor itself will break down further.

[0004] this invention is made in order to solve the trouble mentioned above, it suppresses an excessive turning effort transmitted to a feed roller from a driving gear, and aims at offering the feed equipment which can prevent breakage and failure of this feed roller and driving gear.

[0005]

[Means for Solving the Problem] In order to attain this purpose, feed equipment according to claim 1 The form attachment component holding a form, and the feed roller which conveys the form laid in the form attachment component, The electrode-holder member supported to revolve possible [rotation of the feed roller] and the driving shaft connected with the aforementioned feed roller directly or indirectly while supporting the electrode-holder member, It has the frame without front fork supported to revolve possible [rotation of the shaft-orientations both ends of the driving shaft], and the driving gear which gives turning effort to the aforementioned driving shaft supported to revolve by the frame without front fork. It has the transfer member which the turning effort by the aforementioned driving gear is delivered while connoting possible [rotation of the shaft-orientations end section of the aforementioned driving

shaft], and the pressure-welding member which carries out the pressure welding of the transfer member to the aforementioned driving shaft with predetermined frictional force.

[0006] According to this feed equipment according to claim 1, the turning effort of a driving gear is transmitted to a transfer member. While connoting a transfer member possible [rotation of the shaft-orientations end section of the driving shaft supported to revolve by the frame without front fork], the pressure welding of it is carried out to the driving shaft with the predetermined frictional force by the pressure-welding member. Therefore, the turning effort transmitted to the transfer member by the driving gear is transmitted to a driving shaft from a transfer member through the frictional force by the pressure-welding member. The turning effort transmitted to the driving shaft is transmitted to the feed roller supported to revolve by the electrode-holder member, a feed roller rotates in the conveyance direction of a form by this transfer, and the form laid in a form attachment component is conveyed.

[0007] On the other hand, if the turning effort exceeding the predetermined frictional force by the pressure-welding member joins a transfer member, a transfer member will slide to a driving shaft and will be raced in the shaft-orientations end section of a driving shaft. Therefore, the turning effort transmitted to a transfer member by the driving gear is restricted to the force smaller than the predetermined frictional force by the pressure-welding member.

[0008] while the aforementioned driving shaft adjoins the aforementioned transfer member and feed equipment according to claim 2 is formed for it in the shaft-orientations end section of the driving shaft in feed equipment according to claim 1 -- the transfer -- it had the contact side contacted with the side of a member, and the aforementioned pressure-welding member has the energization member which turns the aforementioned transfer member to the aforementioned contact side, and energizes it

[0009] When acting like feed equipment according to claim 1 according to this feed equipment according to claim 2, the transfer member which the turning effort of a driving gear is delivered is energized by the energization member towards the contact side established in the shaft-orientations end section of a driving shaft. this energization force -- transfer -- the pressure welding of the side of a member is carried out to the contact side of a driving shaft -- having -- this pressure welding -- transfer -- frictional force is given between the side of a member, and the contact side of a driving shaft the case where a turning effort smaller than this frictional force joins a transfer member -- the frictional force -- minding -- transfer -- rotation of a member is transmitted to a driving shaft the case where the turning effort exceeding the above-mentioned frictional force joins a transfer member on the other hand -- transfer -- the side of a member slides to the contact side of a driving shaft, and a transfer member races in the shaft-orientations end section of a driving shaft

[0010] In feed equipment according to claim 1 or 2, the aforementioned electrode-holder member connected the driving shaft and the aforementioned feed roller, when the aforementioned driving shaft which supports the electrode-holder member rotated in the direction of 1, and feed equipment according to claim 3 is equipped with the clutch member of which the connection state of the driving shaft and the aforementioned feed roller is canceled between the aforementioned driving shaft and the aforementioned feed roller, when the aforementioned driving shaft rotates in other directions.

[0011] According to this feed equipment according to claim 3, when acting like feed equipment according to claim 1 or 2, if a driving shaft rotates in the direction of 1 when conveying a form to the conveyance direction downstream, a driving shaft and a feed roller will be connected by the clutch member prepared between the driving shaft and feed roller. Rotation of a driving shaft is transmitted to a feed roller by this connection, a feed roller rotates in the conveyance direction of a form, and the form laid in a form attachment component is conveyed in the conveyance direction. On the other hand, if a driving shaft rotates in other directions after conveyance of a form is completed, the connection state of a driving shaft and a feed roller will be canceled by the clutch member. A feed roller is made the state which can be raced towards the anti-conveyance direction of a form by release of this connection state.

[0012] Feed equipment according to claim 4 is set to feed equipment according to claim 3. the aforementioned clutch member The 1st gear connected with the aforementioned feed roller, and the 2nd gear which it estranges from the 1st gear, is prepared in the aforementioned driving shaft, and is rotated united with the driving shaft, The arm member which has the extension section which extends to the

method of outside from the color section fitted in possible [rotation of the aforementioned driving shaft in which the 2nd gear is prepared], and its color section, and is formed in the 1st gear side of the above, or its opposite side at a rockable, the arm -- in order to make it rotation of the clutch gear which is supported to revolve by the extension section of a member possible [rotation] and is engaged by the 2nd gear of the above, and the 2nd gear of the above engaged by the clutch gear interlocked with and to make the aforementioned arm member rock, it has the resistance member which gives a load to the aforementioned clutch gear

[0013] According to this feed equipment according to claim 4, when acting like feed equipment according to claim 3, if a driving shaft rotates in the direction of 1, the 2nd gear will rotate united with the drive gear. this 2nd gear -- an arm -- the clutch gear supported to revolve by the extension section of a member is engaged, and the load is given to this clutch gear by the resistance member for this reason -- if a driving shaft rotates in the direction of 1 united with the 2nd gear -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, rotation of the 2nd gear is interlocked with, the center of oscillation rocks a driving shaft to the 1st gear side, and a clutch gear is engaged by this rocking with the 1st gear if a still bigger turning effort joins a driving shaft after this engagement -- the driving shaft -- an arm -- it rotates sliding by the color circles of a member, and it is rotated by the 2nd gear, the clutch gear engaged by the 2nd gear resisting the load by the resistance member The 1st gear rotates by rotation of this clutch gear, and a feed roller rotates in the conveyance direction of a form.

[0014] On the other hand, if a driving shaft rotates in other directions, rotation of a clutch gear will be again suppressed by the load by the resistance member. if the 2nd gear rotates further in other directions united with a driving shaft -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, it is interlocked with rotation of the 2nd gear and the center of oscillation rocks a driving shaft to the opposite side by the side of the 1st gear A clutch gear is estranged by this rocking from the 1st gear, an engagement state with the 1st gear is canceled, and the feed roller connected with the 1st gear is made into the state which can be raced towards the anti-conveyance direction of a form.

[0015] Feed equipment according to claim 5 is set to feed equipment according to claim 1 or 2. the aforementioned electrode-holder member When it is supported possible [rotation] to the aforementioned driving shaft and the aforementioned driving shaft rotates in the direction of 1, while connecting the driving shaft and the aforementioned feed roller When the aforementioned driving shaft rotates in other directions, it has the clutch member which transmits the turning effort of the driving shaft to the aforementioned electrode-holder member, and pushes the electrode-holder member to an opposite side with the aforementioned form attachment component side between the aforementioned driving shaft and the aforementioned feed roller.

[0016] According to this feed equipment according to claim 5, when acting like feed equipment according to claim 1 or 2, if a driving shaft rotates in the direction of 1 when conveying a form to the conveyance direction downstream, a driving shaft and a feed roller will be connected by the clutch member prepared between the driving shaft and feed roller. Rotation of a driving shaft is transmitted to a feed roller by this connection, a feed roller rotates in the conveyance direction of a form, and the form laid in a form attachment component is conveyed in the conveyance direction. On the other hand, if a driving shaft rotates in other directions after conveyance of a form is completed, the turning effort of a driving shaft will be transmitted to a electrode-holder member, the electrode-holder member will be pushed by the clutch member with a form attachment component side to an opposite side, and it will be estranged from the form with which a feed roller is laid in a form attachment component.

[0017] Feed equipment according to claim 6 is set to feed equipment according to claim 5. the aforementioned clutch member The 1st gear connected with the aforementioned feed roller, and the 2nd gear which it estranges from the 1st gear, is prepared in the aforementioned driving shaft, and is rotated united with the driving shaft, The arm member which has the extension section which extends to the method of outside from the color section fitted in possible [rotation of the aforementioned driving shaft in which the 2nd gear is prepared], and its color section, and is formed in the 1st gear side of the above,

or its opposite side at a rockable, the arm, in order to make it rotation of the clutch gear which is supported to revolve by the extension section of a member possible [rotation] and is engaged by the 2nd gear of the above, and the 2nd gear of the above engaged by the clutch gear interlocked with and to make the aforementioned arm member rock It has the resistance member which gives a load to the aforementioned clutch gear, and the electrode-holder frame with which the 1st gear side of the above is pushed by the aforementioned arm member to an opposite side while being prepared in the aforementioned electrode-holder member and supporting the aforementioned feed roller to revolve.

[0018] According to this feed equipment according to claim 6, when acting like feed equipment according to claim 5, if a driving shaft rotates in the direction of 1, the 2nd gear will rotate united with the drive gear. this 2nd gear -- an arm -- the clutch gear supported to revolve by the extension section of a member is engaged, and the load is given to this clutch gear by the resistance member for this reason -- if a driving shaft rotates in the direction of 1 united with the 2nd gear -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, rotation of the 2nd gear is interlocked with, the center of oscillation rocks a driving shaft to the 1st gear side, and a clutch gear is engaged by this rocking with the 1st gear if a still bigger turning effort joins a driving shaft after this engagement -- the driving shaft -- an arm -- it rotates sliding by the color circles of a member, and it is rotated by the 2nd gear, the clutch gear engaged by the 2nd gear resisting the load by the resistance member The 1st gear rotates by rotation of this clutch gear, and a feed roller rotates in the conveyance direction of a form.

[0019] On the other hand, if a driving shaft rotates in other directions, rotation of a clutch gear will be again suppressed by the load by the resistance member. if the 2nd gear rotates further in other directions united with a driving shaft -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, it is interlocked with rotation of the 2nd gear and the center of oscillation rocks a driving shaft to the opposite side by the side of the 1st gear The electrode-holder frame prepared in a electrode-holder member is pushed by the arm member with the 1st gear side with this rocking to an opposite side, and it is estranged from the form with which a feed roller is laid in a form attachment component by this push.

[0020] feed equipment according to claim 7 -- feed equipment according to claim 4 or 6 -- setting -- the 1st gear of the above -- the aforementioned arm -- it prepares in the aforementioned form attachment component side to the aforementioned clutch gear supported to revolve by the extension section of a member -- having -- the aforementioned arm -- it engages with the aforementioned clutch gear by rocking the extension section of a member to the form attachment component side

[0021] the case where, as for feed equipment according to claim 8, the aforementioned clutch gear is engaged in feed equipment according to claim 4 or 6 by the 1st gear of the above, as for the aforementioned electrode-holder member -- the aforementioned arm -- it has the limit member which restricts rocking operation by the side of the 1st gear of the above of a member

[0022]

[Embodiments of the Invention] Hereafter, the desirable example of this invention is explained with reference to an accompanying drawing. Drawing 1 is the appearance perspective diagram of the multirole peripheral device 1 which carried the feed equipment 10 (refer to drawing 2) which is one example of this invention. This multirole peripheral device 1 is equipped with various kinds of functions, such as a facsimile function, printer ability, scanner ability, a copy function, and a video function.

[0023] As shown in drawing 1 , the multirole peripheral device 1 is equipped with the main part 2 of equipment formed in the abbreviation box-like object, and the control panel 3 is arranged in the upper surface section of this main part 2 of equipment. Various kinds of buttons, such as number button 3a of "0" - "9" and start button 3b, are prepared in the control panel 3, and various kinds of operations are performed to it by carrying out the depression of these buttons. A liquid crystal display (LCD) 4 is formed in the rear of a control panel 3, and an established state, various kinds of operation messages, etc. of the multirole peripheral device 1 are displayed on it if needed.

[0024] The manuscript installation section 5 which the facsimile manuscript transmitted to partner

facsimile apparatus at the time of a facsimile function and the copy manuscript copied at the time of a copy function can laminating lay is formed in the rear of LCD4. Various kinds of manuscripts laid in this manuscript installation section 5 are conveyed in the main part of equipment 2 interior, and the picture drawn on the front face of the manuscript with the scanner (not shown) is read. The manuscript with which the picture was read is conveyed further and discharged by the manuscript discharge section 6 prepared under the control panel 3.

[0025] The recording paper fit-in section 8 which is the space for fitting in two or more sheets of recording papers P in the state of a laminating is formed in the rear of the manuscript installation section 5. The recording paper P fitted in the recording paper fit-in section 8 is discharged from the recording paper discharge section 9 prepared under the manuscript discharge section 6, after being conveyed into the main part 2 of equipment by the feed equipment 10 mentioned later and printing a picture by the printer (not shown).

[0026] Drawing 2 is the appearance perspective diagram of the feed equipment 10 carried in the multirole peripheral device 1, and the arrow X in drawing shows the conveyance direction of the recording paper P. In addition, in drawing 2, the illustration of the connection gears 17-21 (refer to drawing 3) which transmits the turning effort of a drive motor (not shown) to transfer gear 16a of the transfer unit 16 is omitted.

[0027] As shown in drawing 2, feed equipment 10 is equipped with the fit-in section frame 11 held in the interior of the main part 2 of equipment, and the fit-in section covering 12, and the above-mentioned recording paper fit-in section 8 is constituted by these each part material 11 and 12 in the space which can fit in the recording paper P. Mainly, the fit-in section frame 11 is equipped with installation board 11a, guide plate 11b, and the side-attachment-wall boards 11c and 11d of a couple, and forms these each part material 11a-11d in one by the resin etc. Installation board 11a is for supporting the recording paper P fitted in the recording paper fit-in section 8, and this recording paper P is formed possible

[installation] in the laminating state.

[0028] Installation board 11a is prepared in the rear (drawing 2 right-hand side) of the fit-in section frame 11, and the recording paper supporter material 13 is further installed in the upper limit of this installation board 11a towards the upper part from the installation board 11a. The recording paper supporter material 13 consists of abbreviation KO character-like bars, when the form length of the recording paper P is big, can hold the top portion of the recording paper P fitted in the recording paper fit-in section 8, and can prevent that the top portion of the recording paper P hangs down.

[0029] The downward inclination of the installation board 11a is carried out towards the front part bottom (drawing 2 lower left side) from the rear bottom (drawing 2 upper right side) of the fit-in section frame 11, and the ends (drawing 2 right-hand side) of guide plate 11b are formed successively by the soffit of this installation board 11a. what shows the recording paper P with which guide plate 11b is laid in installation board 11a to a printer (not shown) side -- it is -- the arrangement side (drawing 2 left-hand side) of a successive formation portion (drawing 2 right-hand side) with installation board 11a to a printer (not shown) -- abbreviation -- it is installed horizontally Therefore, the recording paper P laid in installation board 11a is guided in the abbreviation level state along the upper surface of guide plate 11a to a printer. Moreover, the side-attachment-wall boards 11c and 11d of a couple are set up by the crosswise ends of installation board 11a and guide plate 11b.

[0030] The side-attachment-wall boards 11c and 11d of a couple separated the predetermined interval, and have countered, and the recording paper guide 11a1 and 11a2 are arranged at the side-attachment-wall board 11c [in installation board 11a], and 11d side, respectively. The recording paper guide 11a1 and 11a2 are connected by the rack (not shown) and pinion (not shown) which are prepared in the fit-in section frame 11, and they are constituted possible [movement to the cross direction of installation board 11a] so that it may interlock by these racks and pinions and may correspond to the form width of face of the recording paper P. Therefore, the recording paper P laid in installation board 11a is fitted in between the recording paper guide 11a1 of a couple, and 11a2, and is laid in installation board 11a. Moreover, between side-attachment-wall boards [of a couple / 11c and 11d] opposed faces, installation board 11a and a predetermined interval are separated, the fit-in section covering 12 is pinched, and the

crosswise ends of this fit-in section covering 12 are attached in the side-attachment-wall boards 11c and 11d, respectively.

[0031] The recording paper fit-in section 8 mentioned above is formed in the space surrounded with each part material 11a-11d and the fit-in section covering 12 of these fit-in section frames 11, and feed mouth 8a which can insert the recording paper P is prepared in this recording paper fit-in section 8. Moreover, between the fit-in section covering 12 and guide plate 11b, the crevice between predetermined width of face is prepared, and exhaust port 8b for discharging the recording paper P from the recording paper fit-in section 8 into this crevice portion is prepared. This exhaust port 8b is opened for free passage with the interior of the recording paper fit-in section 8, and the recording paper P fitted in the recording paper fit-in section 8 is formed possible [passage].

[0032] The transfer unit 16 which transmits turning effort to the driving shaft 15 mentioned later is arranged by the non-opposed face (drawing 2 near side) with side-attachment-wall board 11c in 11d of side-attachment-wall boards, and 4 is projected and prepared in it approximate circle tubed 11d 1-11d shank to the non-opposed face side (drawing 2 near side) with side-attachment-wall board 11c at the under-surface [than this transfer unit 16] portion. Each of this 11d 1-11d shank, 4 is for supporting to revolve the connection gears 17-21 mentioned later, and is projected by abbreviation 1 seriate in order towards the transfer unit 16 side from the soffit 11d of side-attachment-wall boards side.

[0033] Drawing 3 is the side elevation of feed equipment 10, all over drawing, illustrates the pitch circle of each connection gears 17-21 with a dashed line, and is omitting illustration of the gear gear tooth engraved on the periphery of each connection gears 17-21. As shown in drawing 3 , five connection gears 17-21 formed in the shape of a spur gear are supported to revolve with the resin etc. by 4 respectively possible [rotation] 11d 1-11d shank projected from 11d of side-attachment-wall boards. The connection gear 17 is supported to revolve by 1 11d of shanks, and is formed possible [the pinion gear (not shown) attached in the axis of rotation of the drive motor (driving gear) which is not illustrated, and engagement].

[0034] The connection gear 18 supported to revolve by 2 11d of shanks is engaged by the connection gear 17, and the connection gear 19 supported to revolve by 3 11d of shanks is engaged by this connection gear 18. The connection gear 20 supported to revolve by 4 11d of shanks is engaged by the connection gear 19, and the said heart-like connection gear 21 is formed in the connection gear 20 at one. The connection gear 21 is supported to revolve by 4 11d of shanks with the connection gear 20, and this connection gear 21 is engaged by transfer gear 16a of the transfer unit 16.

[0035] Rotation of the axis of rotation of a drive motor is transmitted to transfer gear 16a through a pinion gear and the connection gears 17-21. That is, if the axis of rotation of a drive motor rotates, the rotation will be transmitted in order of a pinion gear and the connection gears 17-21, and these pinion gears and the connection gears 17-21 will rotate. The rotation transmitted to the connection gear 21 is transmitted to transfer gear 16a engaged by the connection gear 21. Furthermore, through the transfer unit 16, the rotation transmitted to transfer gear 16a is transmitted to a driving shaft 15, consequently a driving shaft 15 rotates it.

[0036] Drawing 4 is a cross section in the IV-IV line of drawing 2 , and is omitting illustration of 4 and the connection gears 17-21 all over drawing 11d 1-11d shank prepared in 11d of side-attachment-wall boards. As shown in drawing 4 , abbreviation concave letter-like exclusion mouth 11e is prepared in the lower part (under drawing 4) of installation board 11a, and penetration formation of this exclusion mouth 11e is carried out in the thickness direction (perpendicular direction to the space of drawing 4) of installation board 11a (refer to drawing 9). Exclusion mouth 11e is opening for eliminating the choked recording paper P, when the recording paper P is got blocked in the feed equipment 10 interior 8, i.e., the recording paper fit-in section.

[0037] Although it is necessary to eliminate the recording paper P which inserts a hand from feed mouth 8a, and causes a paper jam when the recording paper P is got blocked with a back side from feed mouth 8a of the recording paper fit-in section 8, since opening width of face is narrow, this feed mouth 8a cannot insert a hand easily. Therefore, in this case, a hand can be inserted in exclusion mouth 11e from a tooth-back 11d of installation boards side (drawing 9 right-hand side), and the recording paper P

leading to the paper jam can be taken out from the inside of the recording paper fit-in section 8.

[0038] The side-attachment-wall boards 11c and 11d of the couple which separates a predetermined interval in the crosswise (longitudinal direction of drawing 4) ends of installation board 11a and guide plate 11b, and counters them are set up, and the both ends of a driving shaft 15 are supported to revolve possible [rotation] with these side-attachment-wall boards 11c and 11d (support). A driving shaft 15 is the axis of rotation for transmitting to the feed roller unit 31 which mentions later rotation of the drive motor transmitted through the transfer unit 16. Moreover, a driving shaft 15 separates installation board 11a and a predetermined interval, and is installed in parallel (refer to drawing 9), and the recording paper P is fitted in between this driving shaft 15 and installation board 11a.

[0039] The transfer unit 16 is arranged in the edge by the side of 11d of side-attachment-wall boards in a driving shaft 15. what the transfer unit 16 delivers rotation (turning effort) of a drive motor (not shown) to a driving shaft 15 -- it is -- mainly -- transfer gear 16a, the transfer plates 16b and 16c, and 16f of spring maintenance boards and compression spring -- it has 16g of members As mentioned above, the drive motor is connected with transfer gear 16a through the connection gears 17-21, rotation of the drive motor transmitted to transfer gear 16a is transmitted to a driving shaft 15 through the transfer unit 16, and a driving shaft 15 rotates it. Here, the detail of the transfer unit 16 is explained with reference to drawing 5 .

[0040] Drawing 5 (a) is the cross section of the transfer unit 16, and drawing 5 (b) is a cross section in the Vb-Vb line of drawing 5 (a). As shown in drawing 5 (a), flange 15a, boss 15b, spring attaching part 15c, and 15d of stopper sections are formed in the end section (drawing 5 (a) right-hand side) of a driving shaft 15 in one.

[0041] Flange 15a is formed in the approximate circle tabular of the shape of the axis of a driving shaft 15, and the said heart, and the flange stopper side 15a1 is formed in the unilateral side (drawing 5 (a) right-hand side) of this flange 15a. Boss 15b has extended from the flange stopper side 15a1. As shown in drawing 5 (b), the periphery both-sides side cuts and lacks this boss 15b in a plane and abbreviation parallel, and for this reason, the cross-section configuration of boss section 15b is formed in the shape of an abbreviation pillbox.

[0042] Moreover, as shown in drawing 5 (a), to the end face by the side of anti-flange 15a of boss 15b, approximate circle pillar-like spring attaching part 15c has extended. 15d of stopper sections protrudes on the edge by the side of anti-boss 15b in this spring attaching part 15c in the direction of a periphery, and 1 is formed in the opposite portion with boss section 15b in 15d of this stopper section 15d of stopper sides.

[0043] the transfer unit 16 -- transfer gear 16a, the transfer plates 16b and 16c, the friction sheets 16d and 16e, and 16f of spring maintenance boards and compression spring -- it has 16g of members Transfer gear 16a is the spur gear formed by the resin etc., and the endocyst of the rotation of boss 15b of a driving shaft 15 of it is made possible to the inner circumference. The friction sheets 16d and 16e of the shape of an approximate circle ring sheet formed by the nonwoven fabric are attached around the right-and-left both-sides side of transfer gear 16a. The transfer plates 16b and 16c formed in the approximate circle ring tabular by the resin etc. were arranged in the right-and-left both sides of transfer gear 16a around which these friction sheets 16d and 16e were attached, and boss 15b of a driving shaft 15 has fitted into the inner circumference of these transfer plates 16b and 16c.

[0044] Each transfer plates 16b and 16c are contacted, respectively with the friction sheets 16d and 16e attached around transfer gear 16a, and two or more slots of the letter of the cross-sectional-view abbreviation for V characters are established in the contact side with each of these friction sheets 16d and 16e. The slot of the shape of a cross section of V characters in each transfer plates 16b and 16c When more than one are formed a driving shaft 15 and in the shape of a concentric circle and two or more of these slots eat into the friction sheets 16d and 16e respectively The planar pressure of the transfer plates 16b and 16c and the friction sheets 16d and 16e is made to equalize, and the frictional resistance between the contact sides of the transfer plates 16b and 16c and the friction sheets 16d and 16e is stabilized.

[0045] Here, as shown in drawing 5 (b), the configuration of the inner circumference of the transfer

plates 16b and 16c is formed in the shape of [which suited the periphery configuration of boss 15b of a driving shaft 15] an abbreviation pillbox. Thus, the transfer plates 16b and 16c can be rotated united with a driving shaft 15 by fitting the inner circumference configuration of the transfer plates 16b and 16c to the periphery configuration of boss 15b. On the other hand, the bore of the inner circumference 16a1 is formed in the bigger circle configuration a little than the outer diameter of boss 15b, and can race transfer gear 16a to boss 15b of a driving shaft 15.

[0046] the anti-transfer gear 16a [in / transfer plate 16c / as shown in drawing 5 (a)] side -- 16f of spring maintenance boards, and compression spring -- 16g of members is arranged 16f of spring maintenance boards -- transfer plate 16c -- compression spring -- it is for holding 16f of members, and is formed in the approximate circle ring tabular a part of periphery section of 16f of spring maintenance boards is crooked in the shape of abbreviation for L characters towards the transfer plate 16c side -- having -- **** -- a part for this flection -- compression spring -- gap of 16f of members is prevented Moreover, 16f of spring maintenance boards engages with 15d of stopper sections which protrude on spring attaching part 15c of a driving shaft 15, and movement by the side of anti-transfer plate 16c (right-hand side of drawing 5 (a)) is regulated by 1 15d of stopper sides of 15d of the stopper section.

[0047] the state where the compression set was elastically carried out between transfer plate 16c and 16f of spring maintenance boards -- compression spring -- 16g of members arranges -- having -- **** -- compression spring -- to the inner circumference which is 16g of members, spring attaching part 15c of a driving shaft 15 has penetrated compression spring -- what 16g of members turns transfer gear 16a to flange 15a of a driving shaft 15, and is energized -- it is -- this compression spring -- right-and-left ends of 16g of members are contacted by transfer plate 16c and 16f of spring maintenance boards, respectively compression spring -- 16g of members energizes transfer plate 16c to the flange 15a side according to the elastic stability, and the pressure welding of the friction sheets 16d and 16e and the transfer plates 16b and 16c which were attached around transfer gear 16a by the energization force is carried out This pressure welding can give frictional force between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c. in addition -- this example -- compression spring -- the pressure around [1 square centimeter] which is added to the transfer plates 16b and 16c by 16g of members is set to 1.5kgf(s)

[0048] Therefore, when the turning effort transmitted to transfer gear 16a is smaller than the frictional force produced between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c, the transfer plates 16b and 16c rotate through this frictional force united with transfer gear 16a. Since boss 15b in a driving shaft 15 fits into the inner circumference of the transfer plates 16b and 16c, a driving shaft 15 rotates united with transfer gear 16a and the transfer plates 16b and 16c. On the other hand, when the turning effort transmitted to transfer gear 16a is larger than the frictional force produced between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c Since the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c slide, transfer gear 16a races relatively to a driving shaft 15, and the turning effort transmitted to a driving shaft 15 by this idling is restricted.

[0049] It returns and explains to drawing 4 . The feed roller unit 31 is supported to revolve by the shaft-orientations abbreviation center section of the driving shaft 15. the electrode holder which the feed roller unit 31 conveys the recording paper P laid in installation board 15a to the guide plate 11b side, and is arranged in the center of shaft-orientations abbreviation of a driving shaft 15 -- it has the member 32

[0050] a electrode holder -- it has extended from the unilateral side (left-hand side of drawing 4) of a member 32, the spring winding section 32a1 formed in approximate circle tubed connoting a driving shaft 15 the spring winding section 32a1 -- a electrode holder -- it is formed in a member 32 and one and the endocyst of the rotation of a driving shaft 15 is made possible to the inner circumference of the spring winding section 32a1 the periphery of the spring winding section 32a1 -- a helper spring -- a member 39 winds -- having -- **** -- this helper spring -- the end of a member 39 -- a screw 40 -- a electrode holder -- it is screwed on the member 32

[0051] Next, with reference to drawing 9 , the detail of the feed roller unit 31 is explained from drawing 6 . the cross section in which drawing 6 shows the internal structure of the feed roller unit 31 -- it is --

the inside of drawing -- a driving shaft 15 and a helper spring -- illustration of a part of member 39 is omitted The feed roller unit 31 is for conveying the recording paper P which drives the feed roller 37 and is laid in installation board 11a by rotation of a driving shaft 15 to the guide plate 11b side.

[0052] it is shown in drawing 6 -- as -- the feed roller unit 31 -- mainly -- a cross-sectional-view abbreviation rectangle-like electrode holder -- a member 32, the drive gear 33, and an arm -- a member 34, the clutch gear 35, and resistance -- it has the member 36, the feed roller 37, and the indirect gear 38 these each part material 32- 36 and 38 are for being prepared between a driving shaft 15 and the feed roller 37, and transmitting rotation of this driving shaft 15 to the feed roller 37

[0053] a electrode holder -- that to which a member 32 accomplishes the skeleton of the feed roller unit 31 -- it is -- this electrode holder -- lower frame 32a which constitutes the pars basilaris ossis occipitalis (drawing 6 back side), the left-hand side section (drawing 6 left-hand side), and the upper part (on drawing 6) of a member 32, and a electrode holder -- it has up frame 32b which constitutes the anterior part (near side of drawing 6) and the right-hand side section (right-hand side of drawing 6) of a member 32

[0054] Lower frame 32a is supported by the rockable to the driving shaft 15, and from the method of left-hand side of lower frame 32a, the spring winding section 32a1 formed in the shape of a cylinder has extended, connoting a driving shaft 15. the spring stop salient 32a2 protrudes on the point of this spring winding section 32a1 -- having -- a helper spring -- defluxion of a member 39 is prevented

[0055] The mounting section 32a3 is arranged in the interior of the left of lower frame 32a, and the screw hole 32a4 for ****ing lower frame 32a and up frame 32b with a screw 40, stopping them, and carrying out them is cut in this mounting section 32a3. moreover, a electrode holder -- it arranges in the right-hand side upper part of a member 32, the drive gear 33 rotated united with a driving shaft 15 connoting a driving shaft 15 -- having -- **** -- the left-hand side of this drive gear 33 -- an arm -- the member 34 is arranged

[0056] an arm -- the member 34 is equipped with color section 34a in which a driving shaft 15 is fitted possible [rotation], and arm section 34b which extends from the color section 34a to the method of outside The clutch gear 35 engaged by the drive gear 33 is fixed to revolve possible [rotation] by the point of the extension portion of arm section 34b. moreover -- between arm section 34b and the clutch gears 35 -- rotation of the drive gear 33 -- interlocking -- an arm -- the resistance which gives frictional resistance (load) to the clutch gear 35 in order to make a member 34 rock -- the member 36 is formed

[0057] a electrode holder -- the approximate circle for conveying the recording paper P in the lower part (under drawing 6) of a member 32 -- the pillar-shaped feed roller 37 is arranged the feed roller 37 -- the shaft-orientations ends -- an approximate circle -- the pillar-shaped roller shafts 37a and 37a protrude -- having -- **** -- these roller shafts 37a and 37a -- a electrode holder -- it is fixed to revolve by the member 32 possible [rotation] Moreover, the feed roller 37 is equipped with roller section 37b which contacts the recording paper P, and gear section 37c for transmitting rotation of a driving shaft 15 to the roller section 37b. Roller section 37b being slippery and racing it, when a big material of skin friction coefficients, such as silicone rubber, is attached by the peripheral face and the front face of the recording paper P is contacted is prevented. Moreover, the indirect gear 38 for transmitting rotation of a driving shaft 15 to roller section 37b is arranged by the portion between the clutch gear 35 and gear section 37c, and this indirect gear 38 is supported to revolve possible [rotation] by the shank 32b1 which protruded on up frame 32b.

[0058] Drawing 7 (a) is the partial expanded sectional view of the feed roller unit 31, and drawing 7 (b) is a cross section in the VII-VII line of drawing 7 (a). in addition, the helper spring wound around the peripheral face of the spring winding section 32a1 in drawing 7 -- illustration of a member 39 is omitted

[0059] it is shown in drawing 7 (a) -- as -- a driving shaft 15 -- the electrode holder of the feed roller unit 31 -- it has penetrated crosswise [of a member 32] (drawing 7 (a) longitudinal direction) As this driving shaft 15 is shown in drawing 7 (b), a part of peripheral face cuts and lacks in an abbreviation plane, it is formed in the shape of cross-section abbreviation for D characters, and the stop sides 15e and 15f for stopping the drive gear 33 are formed.

[0060] As shown in drawing 7 (a), the endocyst of the driving shaft 15 is carried out to the inner

circumference of the drive gear 33. the electrode holder from color section 33a to which the drive gear 33 connotes a driving shaft 15, and its color section 33a -- engagement hook 33b which extends to the method of the outside of right-hand side of a member 32 is formed in one Color section 33a of the drive gear 33 is formed in approximate circle tubed, and is inserted in the right-hand side section of up frame 32b possible [rotation].

[0061] The right end side (drawing 7 right-hand side) of color section 33a in the drive gear 33 is contacted with 15f of stop sides formed in the driving shaft 15. moreover -- the right end side (drawing 7 (a) right-hand side) of color section 33a -- engagement hook 33b -- a electrode holder -- it has extended towards the way outside the member 32 The hook-like salient is formed at the nose of cam, and this engagement hook 33b is engaging with 15g of engagement sections by which this salient was cut in the periphery of a driving shaft 15.

[0062] Thus, the drive gear 33 is positioned and fixed to the shaft orientations of a driving shaft 15, when the right end side of color section 33a is contacted with 15f of stop sides of a driving shaft 15 and the nose of cam of engagement hook 33b engages with 15g of engagement sections of a driving shaft 15. Furthermore, since the configuration of the inner circumference of the gear section 33 conforms to the periphery configuration of a driving shaft 15 where stop side 15e is formed, the drive gear 33 can be rotated united with the driving shaft 15.

[0063] the edge by the side of anti-engagement hook 33b in the drive gear 33 -- an arm -- a member 34 adjoins and is arranged an arm -- it is arranged in the edge by the side of the drive gear 33 of a member 34, abbreviation hollow cylinder-like color section 34a connoting a driving shaft 15 The inner circumference of color section 34a is greatly formed a little from the outer diameter of a driving shaft 15. Therefore, the endocyst of the rotation of a driving shaft 15 is made possible to the inner circumference of this color section 34a. On the periphery (down [of drawing 7]) of color section 34a, arm section 34b has extended to the method of outside, and the drive gear 33 and the clutch gear 35 to engage are supported to revolve by the point of this arm section 34b possible [rotation] at it.

[0064] between the opposed faces of arm section 34b and the clutch gear 35 -- resistance -- the member 36 is formed resistance -- a member 36 presses the side of the clutch gear 35 -- resistance -- the frictional resistance (load) produced between a member 36 and the clutch gear 35 is given, and rotation of the drive gear 33 is interlocked with -- making -- an arm -- it is for making a member 34 rock resistance -- the member 36 is formed of the elastic members 36, such as a metal plate resistance -- a member 36 is inserted between the opposed faces of arm section 34b and the clutch gear 35, where elastic deformation is carried out, and it is attached in arm section 34b this resistance -- the member 36 energized the side of the clutch gear 35 according to the elastic stability, and has given frictional resistance to the clutch gear 35 according to the energization force

[0065] for this reason, the turning effort transmitted from the drive gear 33 -- resistance -- when smaller than the frictional resistance by the member 36, without it rotates the clutch gear 35 by the drive gear 33 -- an arm -- with arm section 34b of a member 34, rotation of the drive gear 33 is interlocked with and the center of oscillation rocks a driving shaft 15 the turning effort transmitted from the drive gear 33 on the other hand -- resistance -- case it is larger than the frictional resistance by the member 36 -- the clutch gear 35 -- resistance -- the frictional resistance by the member 36 is resisted and it rotates by the drive gear 33

[0066] moreover, an arm -- the ends side of color section 34a of a member 34 is contacted by the left-hand side inside of lower frame 32a, and the left lateral of the addendum portion of the drive gear 33, respectively, and the right lateral of the addendum portion of the drive gear 33 is contacted by the right-hand side inside of up frame 32b And since it is positioned to the shaft orientations of a driving shaft 15, feed roller unit 31 the very thing is positioned in the center of shaft-orientations abbreviation of a driving shaft 15, and the drive gear 33 is fixed by the engagement to 15g of engagement sections of engagement hook 33b, and the contact to 15f of stop sides of color section 33a.

[0067] a electrode holder [in / the feed roller unit 31 / in drawing 8] -- it is the sectional side elevation of a member 32 As shown in drawing 8 , the cross-section rectangle frame-like mounting section 32a3 is formed in the base bottom of lower frame 32a. The mounting section 32a3 timbers up frame 32b

corresponding to lower frame 32a, and the upper surface (on drawing 8) of this mounting section 32a3 is contacted with up frame 32b. The screw hole 32a4 which can screw in a screw thread 40 is cut in the contact side with up frame 32b in the mounting section 32a3, and the female screw is formed by the inner skin of this screw hole 32a4.

[0068] On the other hand, the position where **** 41 of an approximate circle configuration corresponds to a contact portion with the mounting section 32a3 in up frame 32b with the screw hole 32a4 of the mounting section 32a3 is punctured. The screw 40 which consisted of wood screws etc. is inserted in this **** 41, and this screw 40 is thrust into the screw hole 32a4 of lower frame 32a. Up frame 32b ****s to lower frame 32a, and is stopped and set to it by screwing in the screw hole 32a4 of this screw 40.

[0069] moreover, the helper spring mentioned above between the head of a screw 40, and up frame 32b - the end of a member 39 pinches -- having -- this helper spring -- the member 39 is ***** (ed) by lower frame 32a and up frame 32b therefore, a helper spring -- the work which attaches the end of a member 39 in the feed roller unit 31 can be put in block with the work with lower frame 32a and up frame 32b to combine, and can be performed and the screw 41 which ****s, stops and makes up frame 32b lower frame 32a -- a helper spring -- a member 39 -- an electrode holder -- since it is attached in a member 32 -- a helper spring -- it is not necessary to prepare separately the screw thread which ****s, stops and carries out a member 39

[0070] Drawing 9 is a cross section in the IX-IX line of drawing 4, and the arrow X in drawing shows the conveyance direction of the recording paper P. the helper spring which the above-mentioned feed roller unit 31 is supported by the driving shaft 15 between the opposed faces of installation board 11a and the fit-in section covering 12 which constitute the recording paper fit-in section 8, and was mentioned above in the spring winding section 32a1 of this feed roller unit 31 as shown in _____ -- the member 39 is wound a helper spring -- the end of a member 39 -- a screw 40 -- an electrode holder -- it screws on a member 32 -- having -- **** -- a helper spring -- being contacted by the inside upper surface of hold section 12a of the fit-in covering 12 in the state where bent elastically and it deformed for this reason, a helper spring -- since the feed roller unit 31 is energized by the member 39 to the installation board 11a side at the circumference of a driving shaft 15, it can push the feed roller 37 of the feed roller unit 31 against the installation board 11a side, and can stick it on the recording paper P by it

[0071] Moreover, the fit-in section covering 12 mentioned above is formed in the non-

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in the feed roller unit 31 and opposite portion in this fit-

roller unit 31 rocks to the fit-in section covering 12 side to the circumference of a driving shaft 15, the feed roller unit 31 can be held in hold section 12a. For this reason, the conveyance direction (_____ longitudinal direction) size of the recording paper P in feed equipment 10 can be miniaturized.

[0072] _____ (a) is the sectional side elevation of the feed roller unit 31 in the state where the feed roller 37 was contacted by installation board 11a, and _____ (b) is the sectional side elevation of the feed roller unit 31 in the state where the feed roller 37 was estranged from installation board 11a. In addition, in _____, a dashed line illustrates the pitch circle of the clutch gear 35 and the indirect

[0073] it is shown in _____ (a) and (b) -- as -- an arm -- arm section 34b of a member 34 is formed in the shape of side view abbreviation for T characters concrete -- an arm -- while the clutch gear 35 is supported to revolve by the point of arm section 34b which extends from color section 34a of a member 34 possible [rotation], the stopper section 34b1 and 34b2 have extended in the shape of a straight line toward the radial outside of the clutch gear 35, respectively from the support portion of the clutch gear 35 an arm -- when arm section 34b of a member 34 rocks to a clockwise rotation, the point of the stopper section 34b1 is contacted by the base 32a5 of lower frame 32a shown in (a) of _____ other hand -- an arm -- when arm section 34b of a member 34 rocks to a counterclockwise rotation, the

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] this invention suppresses an excessive turning effort especially transmitted to a feed roller from a driving gear about the feed equipment used for image formation equipments, such as a copying machine, a printer, and facsimile, and relates to the feed equipment which can prevent breakage and failure of this feed roller and driving gear.

[0002]

[Description of the Prior Art] There are some which are constituted so that the recording paper may be conveyed in the predetermined conveyance direction in the feed equipment used for facsimile etc. by making a feed roller contact the upper surface of two or more recording papers by which the laminating was carried out, and rotating the feed roller in the conveyance direction of the recording paper.

Generally with this kind of feed equipment, it has the feed roller which conveys the recording paper, the motor which generates turning effort, and two or more gears which transmit the turning effort of the motor to a feed roller. According to this feed equipment, the turning effort of a motor is transmitted to a feed roller by two or more gears, a feed roller rotates in the conveyance direction of the recording paper, and the recording paper is conveyed by this transfer.

[0003]

[Problem(s) to be Solved by the Invention] However, with above feed equipment, since a motor and a feed roller are always connected through two or more gears, even if rotation of a feed roller is inhibited by the paper jam etc. or the rotational resistance of a feed roller increases, the turning effort of a motor will continue being transmitted to a feed roller or two or more gears. For this reason, the excessive rotation load acted on a feed roller or two or more gears, and there was a trouble that these feeding roller and a gear will be damaged. Moreover, when a motor also had the rotation inhibited, it did not drive as the driving pulse signal, but there was a trouble that the noise resulting from repeating rotation of the right inversion direction will occur, or the motor itself will break down further.

[0004] this invention is made in order to solve the trouble mentioned above, it suppresses an excessive turning effort transmitted to a feed roller from a driving gear, and aims at offering the feed equipment which can prevent breakage and failure of this feed roller and driving gear.

[0005]

[Means for Solving the Problem] In order to attain this purpose, feed equipment according to claim 1 The form attachment component holding a form, and the feed roller which conveys the form laid in the form attachment component, The electrode-holder member supported to revolve possible [rotation of the feed roller] and the driving shaft connected with the aforementioned feed roller directly or indirectly while supporting the electrode-holder member, It has the frame without front fork supported to revolve possible [rotation of the shaft-orientations both ends of the driving shaft], and the driving gear which gives turning effort to the aforementioned driving shaft supported to revolve by the frame without front fork. It has the transfer member which the turning effort by the aforementioned driving gear is delivered while connoting possible [rotation of the shaft-orientations end section of the aforementioned driving

shaft], and the pressure-welding member which carries out the pressure welding of the transfer member to the aforementioned driving shaft with predetermined frictional force.

[0006] According to this feed equipment according to claim 1, the turning effort of a driving gear is transmitted to a transfer member. While connoting a transfer member possible [rotation of the shaft-orientations end section of the driving shaft supported to revolve by the frame without front fork], the pressure welding of it is carried out to the driving shaft with the predetermined frictional force by the pressure-welding member. Therefore, the turning effort transmitted to the transfer member by the driving gear is transmitted to a driving shaft from a transfer member through the frictional force by the pressure-welding member. The turning effort transmitted to the driving shaft is transmitted to the feed roller supported to revolve by the electrode-holder member, a feed roller rotates in the conveyance direction of a form by this transfer, and the form laid in a form attachment component is conveyed.

[0007] On the other hand, if the turning effort exceeding the predetermined frictional force by the pressure-welding member joins a transfer member, a transfer member will slide to a driving shaft and will be raced in the shaft-orientations end section of a driving shaft. Therefore, the turning effort transmitted to a transfer member by the driving gear is restricted to the force smaller than the predetermined frictional force by the pressure-welding member.

[0008] while the aforementioned driving shaft adjoins the aforementioned transfer member and feed equipment according to claim 2 is formed for it in the shaft-orientations end section of the driving shaft in feed equipment according to claim 1 -- the transfer -- it had the contact side contacted with the side of a member, and the aforementioned pressure-welding member has the energization member which turns the aforementioned transfer member to the aforementioned contact side, and energizes it

[0009] When acting like feed equipment according to claim 1 according to this feed equipment according to claim 2, the transfer member which the turning effort of a driving gear is delivered is energized by the energization member towards the contact side established in the shaft-orientations end section of a driving shaft. this energization force -- transfer -- the pressure welding of the side of a member is carried out to the contact side of a driving shaft -- having -- this pressure welding -- transfer -- frictional force is given between the side of a member, and the contact side of a driving shaft the case where a turning effort smaller than this frictional force joins a transfer member -- the frictional force -- minding -- transfer -- rotation of a member is transmitted to a driving shaft the case where the turning effort exceeding the above-mentioned frictional force joins a transfer member on the other hand -- transfer -- the side of a member slides to the contact side of a driving shaft, and a transfer member races in the shaft-orientations end section of a driving shaft

[0010] In feed equipment according to claim 1 or 2, the aforementioned electrode-holder member connected the driving shaft and the aforementioned feed roller, when the aforementioned driving shaft which supports the electrode-holder member rotated in the direction of 1, and feed equipment according to claim 3 is equipped with the clutch member of which the connection state of the driving shaft and the aforementioned feed roller is canceled between the aforementioned driving shaft and the aforementioned feed roller, when the aforementioned driving shaft rotates in other directions.

[0011] According to this feed equipment according to claim 3, when acting like feed equipment according to claim 1 or 2, if a driving shaft rotates in the direction of 1 when conveying a form to the conveyance direction downstream, a driving shaft and a feed roller will be connected by the clutch member prepared between the driving shaft and feed roller. Rotation of a driving shaft is transmitted to a feed roller by this connection, a feed roller rotates in the conveyance direction of a form, and the form laid in a form attachment component is conveyed in the conveyance direction. On the other hand, if a driving shaft rotates in other directions after conveyance of a form is completed, the connection state of a driving shaft and a feed roller will be canceled by the clutch member. A feed roller is made the state which can be raced towards the anti-conveyance direction of a form by release of this connection state.

[0012] Feed equipment according to claim 4 is set to feed equipment according to claim 3. the aforementioned clutch member The 1st gear connected with the aforementioned feed roller, and the 2nd gear which it estranges from the 1st gear, is prepared in the aforementioned driving shaft, and is rotated united with the driving shaft, The arm member which has the extension section which extends to the

method of outside from the color section fitted in possible [rotation of the aforementioned driving shaft in which the 2nd gear is prepared], and its color section, and is formed in the 1st gear side of the above, or its opposite side at a rockable, the arm -- in order to make it rotation of the clutch gear which is supported to revolve by the extension section of a member possible [rotation] and is engaged by the 2nd gear of the above, and the 2nd gear of the above engaged by the clutch gear interlocked with and to make the aforementioned arm member rock, it has the resistance member which gives a load to the aforementioned clutch gear

[0013] According to this feed equipment according to claim 4, when acting like feed equipment according to claim 3, if a driving shaft rotates in the direction of 1, the 2nd gear will rotate united with the drive gear. this 2nd gear -- an arm -- the clutch gear supported to revolve by the extension section of a member is engaged, and the load is given to this clutch gear by the resistance member for this reason -- if a driving shaft rotates in the direction of 1 united with the 2nd gear -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, rotation of the 2nd gear is interlocked with, the center of oscillation rocks a driving shaft to the 1st gear side, and a clutch gear is engaged by this rocking with the 1st gear if a still bigger turning effort joins a driving shaft after this engagement -- the driving shaft -- an arm -- it rotates sliding by the color circles of a member, and it is rotated by the 2nd gear, the clutch gear engaged by the 2nd gear resisting the load by the resistance member The 1st gear rotates by rotation of this clutch gear, and a feed roller rotates in the conveyance direction of a form.

[0014] On the other hand, if a driving shaft rotates in other directions, rotation of a clutch gear will be again suppressed by the load by the resistance member. if the 2nd gear rotates further in other directions united with a driving shaft -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, it is interlocked with rotation of the 2nd gear and the center of oscillation rocks a driving shaft to the opposite side by the side of the 1st gear A clutch gear is estranged by this rocking from the 1st gear, an engagement state with the 1st gear is canceled, and the feed roller connected with the 1st gear is made into the state which can be raced towards the anti-conveyance direction of a form.

[0015] Feed equipment according to claim 5 is set to feed equipment according to claim 1 or 2. the aforementioned electrode-holder member When it is supported possible [rotation] to the aforementioned driving shaft and the aforementioned driving shaft rotates in the direction of 1, while connecting the driving shaft and the aforementioned feed roller When the aforementioned driving shaft rotates in other directions, it has the clutch member which transmits the turning effort of the driving shaft to the aforementioned electrode-holder member, and pushes the electrode-holder member to an opposite side with the aforementioned form attachment component side between the aforementioned driving shaft and the aforementioned feed roller.

[0016] According to this feed equipment according to claim 5, when acting like feed equipment according to claim 1 or 2, if a driving shaft rotates in the direction of 1 when conveying a form to the conveyance direction downstream, a driving shaft and a feed roller will be connected by the clutch member prepared between the driving shaft and feed roller. Rotation of a driving shaft is transmitted to a feed roller by this connection, a feed roller rotates in the conveyance direction of a form, and the form laid in a form attachment component is conveyed in the conveyance direction. On the other hand, if a driving shaft rotates in other directions after conveyance of a form is completed, the turning effort of a driving shaft will be transmitted to a electrode-holder member, the electrode-holder member will be pushed by the clutch member with a form attachment component side to an opposite side, and it will be estranged from the form with which a feed roller is laid in a form attachment component.

[0017] Feed equipment according to claim 6 is set to feed equipment according to claim 5. the aforementioned clutch member The 1st gear connected with the aforementioned feed roller, and the 2nd gear which it estranges from the 1st gear, is prepared in the aforementioned driving shaft, and is rotated united with the driving shaft, The arm member which has the extension section which extends to the method of outside from the color section fitted in possible [rotation of the aforementioned driving shaft in which the 2nd gear is prepared], and its color section, and is formed in the 1st gear side of the above,

or its opposite side at a rockable, the arm, in order to make it rotation of the clutch gear which is supported to revolve by the extension section of a member possible [rotation] and is engaged by the 2nd gear of the above, and the 2nd gear of the above engaged by the clutch gear interlocked with and to make the aforementioned arm member rock It has the resistance member which gives a load to the aforementioned clutch gear, and the electrode-holder frame with which the 1st gear side of the above is pushed by the aforementioned arm member to an opposite side while being prepared in the aforementioned electrode-holder member and supporting the aforementioned feed roller to revolve.

[0018] According to this feed equipment according to claim 6, when acting like feed equipment according to claim 5, if a driving shaft rotates in the direction of 1, the 2nd gear will rotate united with the drive gear. this 2nd gear -- an arm -- the clutch gear supported to revolve by the extension section of a member is engaged, and the load is given to this clutch gear by the resistance member for this reason -- if a driving shaft rotates in the direction of 1 united with the 2nd gear -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, rotation of the 2nd gear is interlocked with, the center of oscillation rocks a driving shaft to the 1st gear side, and a clutch gear is engaged by this rocking with the 1st gear if a still bigger turning effort joins a driving shaft after this engagement -- the driving shaft -- an arm -- it rotates sliding by the color circles of a member, and it is rotated by the 2nd gear, the clutch gear engaged by the 2nd gear resisting the load by the resistance member The 1st gear rotates by rotation of this clutch gear, and a feed roller rotates in the conveyance direction of a form.

[0019] On the other hand, if a driving shaft rotates in other directions, rotation of a clutch gear will be again suppressed by the load by the resistance member. if the 2nd gear rotates further in other directions united with a driving shaft -- an arm -- the extension section of a member supporting to revolve the clutch gear to which the load was given by the resistance member, it is interlocked with rotation of the 2nd gear and the center of oscillation rocks a driving shaft to the opposite side by the side of the 1st gear The electrode-holder frame prepared in a electrode-holder member is pushed by the arm member with the 1st gear side with this rocking to an opposite side, and it is estranged from the form with which a feed roller is laid in a form attachment component by this push.

[0020] feed equipment according to claim 7 -- feed equipment according to claim 4 or 6 -- setting -- the 1st gear of the above -- the aforementioned arm -- it prepares in the aforementioned form attachment component side to the aforementioned clutch gear supported to revolve by the extension section of a member -- having -- the aforementioned arm -- it engages with the aforementioned clutch gear by rocking the extension section of a member to the form attachment component side

[0021] the case where, as for feed equipment according to claim 8, the aforementioned clutch gear is engaged in feed equipment according to claim 4 or 6 by the 1st gear of the above, as for the aforementioned electrode-holder member -- the aforementioned arm -- it has the limit member which restricts rocking operation by the side of the 1st gear of the above of a member

[0022]

[Embodiments of the Invention] Hereafter, the desirable example of this invention is explained with reference to an accompanying drawing. Drawing 1 is the appearance perspective diagram of the multirole peripheral device 1 which carried the feed equipment 10 (refer to drawing 2) which is one example of this invention. This multirole peripheral device 1 is equipped with various kinds of functions, such as a facsimile function, printer ability, scanner ability, a copy function, and a video function.

[0023] As shown in drawing 1 , the multirole peripheral device 1 is equipped with the main part 2 of equipment formed in the abbreviation box-like object, and the control panel 3 is arranged in the upper surface section of this main part 2 of equipment. Various kinds of buttons, such as number button 3a of "0" - "9" and start button 3b, are prepared in the control panel 3, and various kinds of operations are performed to it by carrying out the depression of these buttons. A liquid crystal display (LCD) 4 is formed in the rear of a control panel 3, and an established state, various kinds of operation messages, etc. of the multirole peripheral device 1 are displayed on it if needed.

[0024] The manuscript installation section 5 which the facsimile manuscript transmitted to partner

facsimile apparatus at the time of a facsimile function and the copy manuscript copied at the time of a copy function can laminating lay is formed in the rear of LCD4. Various kinds of manuscripts laid in this manuscript installation section 5 are conveyed in the main part of equipment 2 interior, and the picture drawn on the front face of the manuscript with the scanner (not shown) is read. The manuscript with which the picture was read is conveyed further and discharged by the manuscript discharge section 6 prepared under the control panel 3.

[0025] The recording paper fit-in section 8 which is the space for fitting in two or more sheets of recording papers P in the state of a laminating is formed in the rear of the manuscript installation section 5. The recording paper P fitted in the recording paper fit-in section 8 is discharged from the recording paper discharge section 9 prepared under the manuscript discharge section 6, after being conveyed into the main part 2 of equipment by the feed equipment 10 mentioned later and printing a picture by the printer (not shown).

[0026] Drawing 2 is the appearance perspective diagram of the feed equipment 10 carried in the multirole peripheral device 1, and the arrow X in drawing shows the conveyance direction of the recording paper P. In addition, in drawing 2, the illustration of the connection gears 17-21 (refer to drawing 3) which transmits the turning effort of a drive motor (not shown) to transfer gear 16a of the transfer unit 16 is omitted.

[0027] As shown in drawing 2, feed equipment 10 is equipped with the fit-in section frame 11 held in the interior of the main part 2 of equipment, and the fit-in section covering 12, and the above-mentioned recording paper fit-in section 8 is constituted by these each part material 11 and 12 in the space which can fit in the recording paper P. Mainly, the fit-in section frame 11 is equipped with installation board 11a, guide plate 11b, and the side-attachment-wall boards 11c and 11d of a couple, and forms these each part material 11a-11d in one by the resin etc. Installation board 11a is for supporting the recording paper P fitted in the recording paper fit-in section 8, and this recording paper P is formed possible

[installation] in the laminating state.

[0028] Installation board 11a is prepared in the rear (drawing 2 right-hand side) of the fit-in section frame 11, and the recording paper supporter material 13 is further installed in the upper limit of this installation board 11a towards the upper part from the installation board 11a. The recording paper supporter material 13 consists of abbreviation KO character-like bars, when the form length of the recording paper P is big, can hold the top portion of the recording paper P fitted in the recording paper fit-in section 8, and can prevent that the top portion of the recording paper P hangs down.

[0029] The downward inclination of the installation board 11a is carried out towards the front part bottom (drawing 2 lower left side) from the rear bottom (drawing 2 upper right side) of the fit-in section frame 11, and the ends (drawing 2 right-hand side) of guide plate 11b are formed successively by the soffit of this installation board 11a. what shows the recording paper P with which guide plate 11b is laid in installation board 11a to a printer (not shown) side -- it is -- the arrangement side (drawing 2 left-hand side) of a successive formation portion (drawing 2 right-hand side) with installation board 11a to a printer (not shown) -- abbreviation -- it is installed horizontally Therefore, the recording paper P laid in installation board 11a is guided in the abbreviation level state along the upper surface of guide plate 11a to a printer. Moreover, the side-attachment-wall boards 11c and 11d of a couple are set up by the crosswise ends of installation board 11a and guide plate 11b.

[0030] The side-attachment-wall boards 11c and 11d of a couple separated the predetermined interval, and have countered, and the recording paper guide 11a1 and 11a2 are arranged at the side-attachment-wall board 11c [in installation board 11a], and 11d side, respectively. The recording paper guide 11a1 and 11a2 are connected by the rack (not shown) and pinion (not shown) which are prepared in the fit-in section frame 11, and they are constituted possible [movement to the cross direction of installation board 11a] so that it may interlock by these racks and pinions and may correspond to the form width of face of the recording paper P. Therefore, the recording paper P laid in installation board 11a is fitted in between the recording paper guide 11a1 of a couple, and 11a2, and is laid in installation board 11a. Moreover, between side-attachment-wall boards [of a couple / 11c and 11d] opposed faces, installation board 11a and a predetermined interval are separated, the fit-in section covering 12 is pinched, and the

crosswise ends of this fit-in section covering 12 are attached in the side-attachment-wall boards 11c and 11d, respectively.

[0031] The recording paper fit-in section 8 mentioned above is formed in the space surrounded with each part material 11a-11d and the fit-in section covering 12 of these fit-in section frames 11, and feed mouth 8a which can insert the recording paper P is prepared in this recording paper fit-in section 8. Moreover, between the fit-in section covering 12 and guide plate 11b, the crevice between predetermined width of face is prepared, and exhaust port 8b for discharging the recording paper P from the recording paper fit-in section 8 into this crevice portion is prepared. This exhaust port 8b is opened for free passage with the interior of the recording paper fit-in section 8, and the recording paper P fitted in the recording paper fit-in section 8 is formed possible [passage].

[0032] The transfer unit 16 which transmits turning effort to the driving shaft 15 mentioned later is arranged by the non-opposed face (drawing 2 near side) with side-attachment-wall board 11c in 11d of side-attachment-wall boards, and 4 is projected and prepared in it approximate circle tubed 11d 1-11d shank to the non-opposed face side (drawing 2 near side) with side-attachment-wall board 11c at the under-surface [than this transfer unit 16] portion. Each of this 11d 1-11d shank, 4 is for supporting to revolve the connection gears 17-21 mentioned later, and is projected by abbreviation 1 seriate in order towards the transfer unit 16 side from the soffit 11d of side-attachment-wall boards side.

[0033] Drawing 3 is the side elevation of feed equipment 10, all over drawing, illustrates the pitch circle of each connection gears 17-21 with a dashed line, and is omitting illustration of the gear gear tooth engraved on the periphery of each connection gears 17-21. As shown in drawing 3 , five connection gears 17-21 formed in the shape of a spur gear are supported to revolve with the resin etc. by 4 respectively possible [rotation] 11d 1-11d shank projected from 11d of side-attachment-wall boards. The connection gear 17 is supported to revolve by 1 11d of shanks, and is formed possible [the pinion gear (not shown) attached in the axis of rotation of the drive motor (driving gear) which is not illustrated, and engagement].

[0034] The connection gear 18 supported to revolve by 2 11d of shanks is engaged by the connection gear 17, and the connection gear 19 supported to revolve by 3 11d of shanks is engaged by this connection gear 18. The connection gear 20 supported to revolve by 4 11d of shanks is engaged by the connection gear 19, and the said heart-like connection gear 21 is formed in the connection gear 20 at one. The connection gear 21 is supported to revolve by 4 11d of shanks with the connection gear 20, and this connection gear 21 is engaged by transfer gear 16a of the transfer unit 16.

[0035] Rotation of the axis of rotation of a drive motor is transmitted to transfer gear 16a through a pinion gear and the connection gears 17-21. That is, if the axis of rotation of a drive motor rotates, the rotation will be transmitted in order of a pinion gear and the connection gears 17-21, and these pinion gears and the connection gears 17-21 will rotate. The rotation transmitted to the connection gear 21 is transmitted to transfer gear 16a engaged by the connection gear 21. Furthermore, through the transfer unit 16, the rotation transmitted to transfer gear 16a is transmitted to a driving shaft 15, consequently a driving shaft 15 rotates it.

[0036] Drawing 4 is a cross section in the IV-IV line of drawing 2 , and is omitting illustration of 4 and the connection gears 17-21 all over drawing 11d 1-11d shank prepared in 11d of side-attachment-wall boards. As shown in drawing 4 , abbreviation concave letter-like exclusion mouth 11e is prepared in the lower part (under drawing 4) of installation board 11a, and penetration formation of this exclusion mouth 11e is carried out in the thickness direction (perpendicular direction to the space of drawing 4) of installation board 11a (refer to drawing 9). Exclusion mouth 11e is opening for eliminating the choked recording paper P, when the recording paper P is got blocked in the feed equipment 10 interior 8, i.e., the recording paper fit-in section.

[0037] Although it is necessary to eliminate the recording paper P which inserts a hand from feed mouth 8a, and causes a paper jam when the recording paper P is got blocked with a back side from feed mouth 8a of the recording paper fit-in section 8, since opening width of face is narrow, this feed mouth 8a cannot insert a hand easily. Therefore, in this case, a hand can be inserted in exclusion mouth 11e from a tooth-back 11d of installation boards side (drawing 9 right-hand side), and the recording paper P

leading to the paper jam can be taken out from the inside of the recording paper fit-in section 8.

[0038] The side-attachment-wall boards 11c and 11d of the couple which separates a predetermined interval in the crosswise (longitudinal direction of drawing 4) ends of installation board 11a and guide plate 11b, and counters them are set up, and the both ends of a driving shaft 15 are supported to revolve possible [rotation] with these side-attachment-wall boards 11c and 11d (support). A driving shaft 15 is the axis of rotation for transmitting to the feed roller unit 31 which mentions later rotation of the drive motor transmitted through the transfer unit 16. Moreover, a driving shaft 15 separates installation board 11a and a predetermined interval, and is installed in parallel (refer to drawing 9), and the recording paper P is fitted in between this driving shaft 15 and installation board 11a.

[0039] The transfer unit 16 is arranged in the edge by the side of 11d of side-attachment-wall boards in a driving shaft 15. what the transfer unit 16 delivers rotation (turning effort) of a drive motor (not shown) to a driving shaft 15 -- it is -- mainly -- transfer gear 16a, the transfer plates 16b and 16c, and 16f of spring maintenance boards and compression spring -- it has 16g of members As mentioned above, the drive motor is connected with transfer gear 16a through the connection gears 17-21, rotation of the drive motor transmitted to transfer gear 16a is transmitted to a driving shaft 15 through the transfer unit 16, and a driving shaft 15 rotates it. Here, the detail of the transfer unit 16 is explained with reference to drawing 5 .

[0040] Drawing 5 (a) is the cross section of the transfer unit 16, and drawing 5 (b) is a cross section in the Vb-Vb line of drawing 5 (a). As shown in drawing 5 (a), flange 15a, boss 15b, spring attaching part 15c, and 15d of stopper sections are formed in the end section (drawing 5 (a) right-hand side) of a driving shaft 15 in one.

[0041] Flange 15a is formed in the approximate circle tabular of the shape of the axis of a driving shaft 15, and the said heart, and the flange stopper side 15a1 is formed in the unilateral side (drawing 5 (a) right-hand side) of this flange 15a. Boss 15b has extended from the flange stopper side 15a1. As shown in drawing 5 (b), the periphery both-sides side cuts and lacks this boss 15b in a plane and abbreviation parallel, and for this reason, the cross-section configuration of boss section 15b is formed in the shape of an abbreviation pillbox.

[0042] Moreover, as shown in drawing 5 (a), to the end face by the side of anti-flange 15a of boss 15b, approximate circle pillar-like spring attaching part 15c has extended. 15d of stopper sections protrudes on the edge by the side of anti-boss 15b in this spring attaching part 15c in the direction of a periphery, and 1 is formed in the opposite portion with boss section 15b in 15d of this stopper section 15d of stopper sides.

[0043] the transfer unit 16 -- transfer gear 16a, the transfer plates 16b and 16c, the friction sheets 16d and 16e, and 16f of spring maintenance boards and compression spring -- it has 16g of members Transfer gear 16a is the spur gear formed by the resin etc., and the endocyst of the rotation of boss 15b of a driving shaft 15 of it is made possible to the inner circumference. The friction sheets 16d and 16e of the shape of an approximate circle ring sheet formed by the nonwoven fabric are attached around the right-and-left both-sides side of transfer gear 16a. The transfer plates 16b and 16c formed in the approximate circle ring tabular by the resin etc. were arranged in the right-and-left both sides of transfer gear 16a around which these friction sheets 16d and 16e were attached, and boss 15b of a driving shaft 15 has fitted into the inner circumference of these transfer plates 16b and 16c.

[0044] Each transfer plates 16b and 16c are contacted, respectively with the friction sheets 16d and 16e attached around transfer gear 16a, and two or more slots of the letter of the cross-sectional-view abbreviation for V characters are established in the contact side with each of these friction sheets 16d and 16e. The slot of the shape of a cross section of V characters in each transfer plates 16b and 16c When more than one are formed a driving shaft 15 and in the shape of a concentric circle and two or more of these slots eat into the friction sheets 16d and 16e respectively The planar pressure of the transfer plates 16b and 16c and the friction sheets 16d and 16e is made to equalize, and the frictional resistance between the contact sides of the transfer plates 16b and 16c and the friction sheets 16d and 16e is stabilized.

[0045] Here, as shown in drawing 5 (b), the configuration of the inner circumference of the transfer

plates 16b and 16c is formed in the shape of [which suited the periphery configuration of boss 15b of a driving shaft 15] an abbreviation pillbox. Thus, the transfer plates 16b and 16c can be rotated united with a driving shaft 15 by fitting the inner circumference configuration of the transfer plates 16b and 16c to the periphery configuration of boss 15b. On the other hand, the bore of the inner circumference 16a1 is formed in the bigger circle configuration a little than the outer diameter of boss 15b, and can race transfer gear 16a to boss 15b of a driving shaft 15.

[0046] the anti-transfer gear 16a [in / transfer plate 16c / as shown in drawing 5 (a)] side -- 16f of spring maintenance boards, and compression spring -- 16g of members is arranged 16f of spring maintenance boards -- transfer plate 16c -- compression spring -- it is for holding 16f of members, and is formed in the approximate circle ring tabular a part of periphery section of 16f of spring maintenance boards is crooked in the shape of abbreviation for L characters towards the transfer plate 16c side -- having -- **** -- a part for this flecion -- compression spring -- gap of 16f of members is prevented Moreover, 16f of spring maintenance boards engages with 15d of stopper sections which protrude on spring attaching part 15c of a driving shaft 15, and movement by the side of anti-transfer plate 16c (right-hand side of drawing 5 (a)) is regulated by 1 15d of stopper sides of 15d of the stopper section. [0047] the state where the compression set was elastically carried out between transfer plate 16c and 16f of spring maintenance boards -- compression spring -- 16g of members arranges -- having -- **** -- compression spring -- to the inner circumference which is 16g of members, spring attaching part 15c of a driving shaft 15 has penetrated compression spring -- what 16g of members turns transfer gear 16a to flange 15a of a driving shaft 15, and is energized -- it is -- this compression spring -- right-and-left ends of 16g of members are contacted by transfer plate 16c and 16f of spring maintenance boards, respectively compression spring -- 16g of members energizes transfer plate 16c to the flange 15a side according to the elastic stability, and the pressure welding of the friction sheets 16d and 16e and the transfer plates 16b and 16c which were attached around transfer gear 16a by the energization force is carried out This pressure welding can give frictional force between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c. in addition -- this example -- compression spring -- the pressure around [1 square centimeter] which is added to the transfer plates 16b and 16c by 16g of members is set to 1.5kgf(s)

[0048] Therefore, when the turning effort transmitted to transfer gear 16a is smaller than the frictional force produced between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c, the transfer plates 16b and 16c rotate through this frictional force united with transfer gear 16a. Since boss 15b in a driving shaft 15 fits into the inner circumference of the transfer plates 16b and 16c, a driving shaft 15 rotates united with transfer gear 16a and the transfer plates 16b and 16c. On the other hand, when the turning effort transmitted to transfer gear 16a is larger than the frictional force produced between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c Since the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c slide, transfer gear 16a races relatively to a driving shaft 15, and the turning effort transmitted to a driving shaft 15 by this idling is restricted.

[0049] It returns and explains to drawing 4 . The feed roller unit 31 is supported to revolve by the shaft-orientations abbreviation center section of the driving shaft 15. the electrode holder which the feed roller unit 31 conveys the recording paper P laid in installation board 15a to the guide plate 11b side, and is arranged in the center of shaft-orientations abbreviation of a driving shaft 15 -- it has the member 32

[0050] a electrode holder -- it has extended from the unilateral side (left-hand side of drawing 4) of a member 32, the spring winding section 32a1 formed in approximate circle tubed connoting a driving shaft 15 the spring winding section 32a1 -- a electrode holder -- it is formed in a member 32 and one and the endocyst of the rotation of a driving shaft 15 is made possible to the inner circumference of the spring winding section 32a1 the periphery of the spring winding section 32a1 -- a helper spring -- a member 39 winds -- having -- **** -- this helper spring -- the end of a member 39 -- a screw 40 -- a electrode holder -- it is screwed on the member 32

[0051] Next, with reference to drawing 9 , the detail of the feed roller unit 31 is explained from drawing 6 . the cross section in which drawing 6 shows the internal structure of the feed roller unit 31 -- it is --

the inside of drawing -- a driving shaft 15 and a helper spring -- illustration of a part of member 39 is omitted The feed roller unit 31 is for conveying the recording paper P which drives the feed roller 37 and is laid in installation board 11a by rotation of a driving shaft 15 to the guide plate 11b side.

[0052] it is shown in drawing 6 -- as -- the feed roller unit 31 -- mainly -- a cross-sectional-view abbreviation rectangle-like electrode holder -- a member 32, the drive gear 33, and an arm -- a member 34, the clutch gear 35, and resistance -- it has the member 36, the feed roller 37, and the indirect gear 38 these each part material 32- 36 and 38 are for being prepared between a driving shaft 15 and the feed roller 37, and transmitting rotation of this driving shaft 15 to the feed roller 37

[0053] a electrode holder -- that to which a member 32 accomplishes the skeleton of the feed roller unit 31 -- it is -- this electrode holder -- lower frame 32a which constitutes the pars basilaris ossis occipitalis (drawing 6 back side), the left-hand side section (drawing 6 left-hand side), and the upper part (on drawing 6) of a member 32, and a electrode holder -- it has up frame 32b which constitutes the anterior part (near side of drawing 6) and the right-hand side section (right-hand side of drawing 6) of a member 32

[0054] Lower frame 32a is supported by the rockable to the driving shaft 15, and from the method of left-hand side of lower frame 32a, the spring winding section 32a1 formed in the shape of a cylinder has extended, connoting a driving shaft 15. the spring stop salient 32a2 protrudes on the point of this spring winding section 32a1 -- having -- a helper spring -- defluxion of a member 39 is prevented

[0055] The mounting section 32a3 is arranged in the interior of the left of lower frame 32a, and the screw hole 32a4 for ****ing lower frame 32a and up frame 32b with a screw 40, stopping them, and carrying out them is cut in this mounting section 32a3. moreover, a electrode holder -- it arranges in the right-hand side upper part of a member 32, the drive gear 33 rotated united with a driving shaft 15 connoting a driving shaft 15 -- having -- **** -- the left-hand side of this drive gear 33 -- an arm -- the member 34 is arranged

[0056] an arm -- the member 34 is equipped with color section 34a in which a driving shaft 15 is fitted possible [rotation], and arm section 34b which extends from the color section 34a to the method of outside The clutch gear 35 engaged by the drive gear 33 is fixed to revolve possible [rotation] by the point of the extension portion of arm section 34b. moreover -- between arm section 34b and the clutch gears 35 -- rotation of the drive gear 33 -- interlocking -- an arm -- the resistance which gives frictional resistance (load) to the clutch gear 35 in order to make a member 34 rock -- the member 36 is formed

[0057] a electrode holder -- the approximate circle for conveying the recording paper P in the lower part (under drawing 6) of a member 32 -- the pillar-shaped feed roller 37 is arranged the feed roller 37 -- the shaft-orientations ends -- an approximate circle -- the pillar-shaped roller shafts 37a and 37a protrude -- having -- **** -- these roller shafts 37a and 37a -- a electrode holder -- it is fixed to revolve by the member 32 possible [rotation] Moreover, the feed roller 37 is equipped with roller section 37b which contacts the recording paper P, and gear section 37c for transmitting rotation of a driving shaft 15 to the roller section 37b. Roller section 37b being slippery and racing it, when a big material of skin friction coefficients, such as silicone rubber, is attached by the peripheral face and the front face of the recording paper P is contacted is prevented. Moreover, the indirect gear 38 for transmitting rotation of a driving shaft 15 to roller section 37b is arranged by the portion between the clutch gear 35 and gear section 37c, and this indirect gear 38 is supported to revolve possible [rotation] by the shank 32b1 which protruded on up frame 32b.

[0058] Drawing 7 (a) is the partial expanded sectional view of the feed roller unit 31, and drawing 7 (b) is a cross section in the VII-VII line of drawing 7 (a). in addition, the helper spring wound around the peripheral face of the spring winding section 32a1 in drawing 7 -- illustration of a member 39 is omitted

[0059] it is shown in drawing 7 (a) -- as -- a driving shaft 15 -- the electrode holder of the feed roller unit 31 -- it has penetrated crosswise [of a member 32] (drawing 7 (a) longitudinal direction) As this driving shaft 15 is shown in drawing 7 (b), a part of peripheral face cuts and lacks in an abbreviation plane, it is formed in the shape of cross-section abbreviation for D characters, and the stop sides 15e and 15f for stopping the drive gear 33 are formed.

[0060] As shown in drawing 7 (a), the endocyst of the driving shaft 15 is carried out to the inner

circumference of the drive gear 33. the electrode holder from color section 33a to which the drive gear 33 connotes a driving shaft 15, and its color section 33a -- engagement hook 33b which extends to the method of the outside of right-hand side of a member 32 is formed in one Color section 33a of the drive gear 33 is formed in approximate circle tubed, and is inserted in the right-hand side section of up frame 32b possible [rotation].

[0061] The right end side (drawing 7 right-hand side) of color section 33a in the drive gear 33 is contacted with 15f of stop sides formed in the driving shaft 15. moreover -- the right end side (drawing 7 (a) right-hand side) of color section 33a -- engagement hook 33b -- a electrode holder -- it has extended towards the way outside the member 32 The hook-like salient is formed at the nose of cam, and this engagement hook 33b is engaging with 15g of engagement sections by which this salient was cut in the periphery of a driving shaft 15.

[0062] Thus, the drive gear 33 is positioned and fixed to the shaft orientations of a driving shaft 15, when the right end side of color section 33a is contacted with 15f of stop sides of a driving shaft 15 and the nose of cam of engagement hook 33b engages with 15g of engagement sections of a driving shaft 15. Furthermore, since the configuration of the inner circumference of the gear section 33 conforms to the periphery configuration of a driving shaft 15 where stop side 15e is formed, the drive gear 33 can be rotated united with the driving shaft 15.

[0063] the edge by the side of anti-engagement hook 33b in the drive gear 33 -- an arm -- a member 34 adjoins and is arranged an arm -- it is arranged in the edge by the side of the drive gear 33 of a member 34, abbreviation hollow cylinder-like color section 34a connoting a driving shaft 15 The inner circumference of color section 34a is greatly formed a little from the outer diameter of a driving shaft 15. Therefore, the endocyst of the rotation of a driving shaft 15 is made possible to the inner circumference of this color section 34a. On the periphery (down [of drawing 7]) of color section 34a, arm section 34b has extended to the method of outside, and the drive gear 33 and the clutch gear 35 to engage are supported to revolve by the point of this arm section 34b possible [rotation] at it.

[0064] between the opposed faces of arm section 34b and the clutch gear 35 -- resistance -- the member 36 is formed resistance -- a member 36 presses the side of the clutch gear 35 -- resistance -- the frictional resistance (load) produced between a member 36 and the clutch gear 35 is given, and rotation of the drive gear 33 is interlocked with -- making -- an arm -- it is for making a member 34 rock resistance -- the member 36 is formed of the elastic members 36, such as a metal plate resistance -- a member 36 is inserted between the opposed faces of arm section 34b and the clutch gear 35, where elastic deformation is carried out, and it is attached in arm section 34b this resistance -- the member 36 energized the side of the clutch gear 35 according to the elastic stability, and has given frictional resistance to the clutch gear 35 according to the energization force

[0065] for this reason, the turning effort transmitted from the drive gear 33 -- resistance -- when smaller than the frictional resistance by the member 36, without it rotates the clutch gear 35 by the drive gear 33 -- an arm -- with arm section 34b of a member 34, rotation of the drive gear 33 is interlocked with and the center of oscillation rocks a driving shaft 15 the turning effort transmitted from the drive gear 33 on the other hand -- resistance -- case it is larger than the frictional resistance by the member 36 -- the clutch gear 35 -- resistance -- the frictional resistance by the member 36 is resisted and it rotates by the drive gear 33

[0066] moreover, an arm -- the ends side of color section 34a of a member 34 is contacted by the left-hand side inside of lower frame 32a, and the left lateral of the addendum portion of the drive gear 33, respectively, and the right lateral of the addendum portion of the drive gear 33 is contacted by the right-hand side inside of up frame 32b And since it is positioned to the shaft orientations of a driving shaft 15, feed roller unit 31 the very thing is positioned in the center of shaft-orientations abbreviation of a driving shaft 15, and the drive gear 33 is fixed by the engagement to 15g of engagement sections of engagement hook 33b, and the contact to 15f of stop sides of color section 33a.

[0067] a electrode holder [in / the feed roller unit 31 / in drawing 8] -- it is the sectional side elevation of a member 32 As shown in drawing 8 , the cross-section rectangle frame-like mounting section 32a3 is formed in the base bottom of lower frame 32a. The mounting section 32a3 timbers up frame 32b

corresponding to lower frame 32a, and the upper surface (on drawing 8) of this mounting section 32a3 is contacted with up frame 32b. The screw hole 32a4 which can screw in a screw thread 40 is cut in the contact side with up frame 32b in the mounting section 32a3, and the female screw is formed by the inner skin of this screw hole 32a4.

[0068] On the other hand, the position where **** 41 of an approximate circle configuration corresponds to a contact portion with the mounting section 32a3 in up frame 32b with the screw hole 32a4 of the mounting section 32a3 is punctured. The screw 40 which consisted of wood screws etc. is inserted in this **** 41, and this screw 40 is thrust into the screw hole 32a4 of lower frame 32a. Up frame 32b ****s to lower frame 32a, and is stopped and set to it by screwing in the screw hole 32a4 of this screw 40.

[0069] moreover, the helper spring mentioned above between the head of a screw 40, and up frame 32b - the end of a member 39 pinches -- having -- this helper spring -- the member 39 is ***** (ed) by lower frame 32a and up frame 32b therefore, a helper spring -- the work which attaches the end of a member 39 in the feed roller unit 31 can be put in block with the work with lower frame 32a and up frame 32b to combine, and can be performed and the screw 41 which ****s, stops and makes up frame 32b lower frame 32a -- a helper spring -- a member 39 -- a electrode holder -- since it is attached in a member 32 -- a helper spring -- it is not necessary to prepare separately the screw thread which ****s, stops and carries out a member 39

[0070] Drawing 9 is a cross section in the IX-IX line of drawing 4, and the arrow X in drawing shows the conveyance direction of the recording paper P. the helper spring which the above-mentioned feed roller unit 31 is supported by the driving shaft 15 between the opposed faces of installation board 11a and the fit-in section covering 12 which constitute the recording paper fit-in section 8, and was mentioned above in the spring winding section 32a1 of this feed roller unit 31 as shown in drawing 9 -- the member 39 is wound a helper spring -- the end of a member 39 -- a screw 40 -- a electrode holder -- it screws on a member 32 -- having -- **** -- a helper spring -- the other end of a member 39 is stopped, being contacted by the inside upper surface of hold section 12a of the fit-in covering 12 in the state where bent elastically and it deformed for this reason, a helper spring -- since the feed roller unit 31 is energized by the member 39 to the installation board 11a side at the circumference of a driving shaft 15, it can push the feed roller 37 of the feed roller unit 31 against the installation board 11a side, and can stick it on the recording paper P by it

[0071] Moreover, the fit-in section covering 12 mentioned above is formed in the non-opposed face side with installation board 11a in the feed roller unit 31, and hold section 12a which is concave space is cut in the feed roller unit 31 and opposite portion in this fit-in section covering 12. Therefore, when the feed roller unit 31 rocks to the fit-in section covering 12 side to the circumference of a driving shaft 15, the feed roller unit 31 can be held in hold section 12a. For this reason, the conveyance direction (drawing 9 longitudinal direction) size of the recording paper P in feed equipment 10 can be miniaturized.

[0072] Drawing 10 (a) is the sectional side elevation of the feed roller unit 31 in the state where the feed roller 37 was contacted by installation board 11a, and drawing 10 (b) is the sectional side elevation of the feed roller unit 31 in the state where the feed roller 37 was estranged from installation board 11a. In addition, in drawing 10, a dashed line illustrates the pitch circle of the clutch gear 35 and the indirect gear 38, and illustration of the gear gear tooth of each gears 35 and 38 is omitted.

[0073] it is shown in drawing 10 (a) and (b) -- as -- an arm -- arm section 34b of a member 34 is formed in the shape of side view abbreviation for T characters concrete -- an arm -- while the clutch gear 35 is supported to revolve by the point of arm section 34b which extends from color section 34a of a member 34 possible [rotation], the stopper section 34b1 and 34b2 have extended in the shape of a straight line toward the radial outside of the clutch gear 35, respectively from the support portion of the clutch gear 35 an arm -- when arm section 34b of a member 34 rocks to a clockwise rotation, the point of the stopper section 34b1 is contacted by the base 32a5 of lower frame 32a shown in (a) of drawing 10 on the other hand -- an arm -- when arm section 34b of a member 34 rocks to a counterclockwise rotation, the point of the stopper section 34b2 is contacted by the upper surface 32b2 of up frame 32b shown in (b) of drawing 10

[0074] The stopper section 34b1 and 34b2 have extended from the addendum circle of the clutch gear 35 to the method of outside further, respectively. Therefore, when the stopper section 34b1 and 34b2 are contacted each side 32a5 and 32b2, respectively, contact on the addendum of the clutch gear 35 and a frame 32 can be prevented, and damage on the addendum of the clutch gear 35 can be prevented.

[0075] moreover, the clutch gear 35 shown in drawing 10 (a) -- an arm -- a member 34 rocks to a counterclockwise rotation, if it moves to the position shown in drawing 10 (b), the clutch gear 35 and the indirect gear 38 can be made to be able to estrange, and the engagement state of each gears 35 and 38 can be canceled the clutch gear 35 shown in drawing 10 (b) on the other hand -- an arm -- a member 34 rocks to a clockwise rotation, if it moves to the position shown in drawing 10 (a), the clutch gear 35 and the indirect gear 38 can be made to be able to engage, rotation of the clutch gear 35 can be transmitted to the indirect gear 38, and the feed roller 37 can be rotated

[0076] Next, operation of the feed roller unit 31 constituted as mentioned above is explained. If a driving shaft 15 rotates to the clockwise rotation of drawing 10 (b) through the transfer unit 16, united with the driving shaft 15, the drive gear 33 will rotate to the clockwise rotation of drawing 10 (b). Rotation of the drive gear 33 is transmitted to the clutch gear 35 engaged by the drive gear 33. here -- the clutch gear 35 -- resistance -- the frictional resistance by the member 36 -- an arm -- with arm section 34b of a member 34, rotation of the drive gear 33 is interlocked with and the center of oscillation rocks a driving shaft 15 to the indirect gear 38 side (clockwise rotation of drawing 10 (b)) with this rocking, the clutch gear 35 moves to the position shown in drawing 10 (a), and is engaged with the indirect gear 38 -- having -- one of these -- it is -- an arm -- the point of the stopper section 34b1 of a member 34 is contacted by the base 32a5 of lower frame 32a. Since rocking operation by the side of the indirect gear 38 of the clutch gear 35 is restricted by contact on this stopper section 34b1 and base 32a5, the clutch gear 35 and the indirect gear 38 can be made to be always able to engage by the position, and the turning effort of the clutch gear 35 can be smoothly transmitted to the indirect gear 38 by it.

[0077] the drive gear 33 which will be rotated united with a driving shaft 15 if a driving shaft 15 rotates further after the stopper section 34b1 contacts the lower frame 32a5 -- the clutch gear 35 -- resistance -- the frictional resistance by the member 36 is resisted and it rotates. Rotation of the clutch gear 35 is transmitted to the indirect gear 38 engaged by the clutch gear 35. Furthermore, the rotation transmitted to the indirect gear 38 is transmitted to gear section 37c of the feed roller 37, consequently roller section 37b rotates to the counterclockwise rotation of drawing 10 (a), and the recording paper P is conveyed by this rotation in the conveyance direction (the direction of drawing 10 arrow X).

[0078] The clutch gear 35 is located in the anti-installation board 11a side (upper right side of drawing 10 (a)) to the indirect gear 38. for this reason -- if the clutch gear 35 rotates by the drive gear 33 after being engaged with the indirect gear 38 -- the turning effort of this drive gear 33 -- an arm -- a member 34 -- the lower frame 32a side -- further -- it is going to rock -- lower frame 32a -- an arm -- it is pushed by the stopper section 34b1 of a member 34 towards the installation board 11a side. Since the feed roller 37 supported to revolve by the frame 32 is pushed against the installation board 11a side by this push, when the recording paper P is conveyed with the feed roller 37 by it, this feed roller 37 can prevent estranging from the recording paper P, and the recording paper P can be smoothly conveyed by it.

[0079] On the other hand, if a driving shaft 15 rotates to the counterclockwise rotation of drawing 10 (a), united with the driving shaft 15, the drive gear 33 will rotate to the counterclockwise rotation of drawing 10 (a). Rotation of the drive gear 33 is transmitted to the clutch gear 35 engaged by the drive gear 33. here -- the clutch gear 35 -- resistance -- the frictional resistance by the member 36 -- an arm -- with arm section 34b of a member 34, rotation of the drive gear 33 is interlocked with and the center of oscillation rocks a driving shaft 15 to the counterclockwise rotation of drawing 10 (a). With this rocking, the clutch gear 35 is estranged from the indirect gear 38, and is moved to the position shown in drawing 10 (b). If the clutch gear 35 estranges from the indirect gear 38, since the engagement state of both the gears 35 and 38 will be canceled, idling of the feed roller 37 is enabled towards the clockwise rotation of drawing 10 (b). Therefore, in case the recording paper P is taken out from the recording paper fit-in section 8, the recording paper P fitted in between roller section 37b and installation board 11a can be extracted easily.

[0080] moreover, an arm -- rocking to the counterclockwise rotation of a member 34 -- following -- an

arm -- the point of the stopper section 34b2 of a member 34 is contacted by the upper surface 32b2 of up frame 32b this contact -- an arm -- rocking operation towards the counterclockwise rotation of a member 34 and the clutch gear 35 is restricted if a driving shaft 15 rotates further counterclockwise in this state -- the turning effort of the drive gear 33 -- an arm -- a member 34 pushes up frame 32b upwards by the stopper section 34b2 Since up frame 32b is rocked by making a driving shaft 15 into the center of rotation by this push to a counterclockwise rotation, as shown in drawing 10 (b), it can make the feed roller 37 able to estrange from installation board 11a, and can fit the new recording paper P over between feed roller 37b and installation board 11a easily by it.

[0081] As explained above, according to the feed equipment 10 of this example, the transfer unit 16 When the turning effort transmitted to transfer gear 16a is larger than the frictional force produced between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c Since the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c slide, transfer gear 16a is made to race relatively to a driving shaft 15, and the turning effort transmitted to a driving shaft 15 by this idling can be restricted.

[0082] For example, if the drive gear 33 later mentioned by the paper jam etc., the clutch gear 35, the indirect gear 38, the feed roller 37, and the rotation load of a driving shaft 15 increase, although a drive motor tends to increase the turning effort transmitted to transfer gear 16a and it is going to rotate a driving shaft 15 If this turning effort becomes larger than the frictional force produced between the contact sides of the friction sheets 16d and 16e and the transfer plates 16b and 16c, since transfer gear 16a will be raced to a driving shaft 15, the turning effort transmitted to a driving shaft 15 by this transfer gear 16a can be restricted.

[0083] For this reason, it can prevent that an excessive turning effort joins a driving shaft 15, each gears 33, 35, and 38, and the feed roller 37, and can prevent that these each part material 15, 33, 35, 37, and 38 is damaged. And since it can prevent that an overload joins a drive motor and the connection gears 17-21 by making transfer gear 16a race, the noise made in the state of the unusual drive of this drive motor and failure of the drive motor itself can be prevented.

[0084] As mentioned above, although this invention was explained based on the example, this invention is not limited to the above-mentioned example at all, and it can guess it easily for improvement deformation various by within the limits which does not deviate from the meaning of this invention to be possible.

[0085]

[Effect of the Invention] According to image formation equipment according to claim 1, the transfer member connoted possible [rotation of the shaft-orientations end section of a driving shaft] can slide a transfer member to a driving shaft, and can make a transfer member race to a driving shaft, when the turning effort which joins a transfer member exceeds the predetermined frictional force by the pressure-welding member, since a pressure welding is carried out to a driving shaft by the pressure-welding member with predetermined frictional force and turning effort is transmitted to a driving shaft through the frictional force. Therefore, it is effective in the ability to restrict the turning effort transmitted to a transfer member by the driving gear to the force smaller than the predetermined frictional force by the pressure-welding member.

[0086] For example, if the rotation load of a feed roller or a driving shaft increases by the paper jam etc., although a driving gear tends to increase the turning effort transmitted to a transfer member and it is going to rotate a driving shaft, if this turning effort exceeds the predetermined frictional force by the pressure-welding member, since a transfer member will be raced to a driving shaft, the turning effort transmitted to a driving shaft by this transfer member can be restricted. For this reason, it is effective in the ability to prevent that an excessive turning effort joins a driving shaft and a feed roller, and prevent that these driving shafts and feed rollers are damaged.

[0087] And since it can prevent that an overload joins a driving gear by making a transfer member race, there are noise made in the state of the unusual drive of this driving gear and an effect that failure of the driving gear itself can be prevented.

[0088] the effect that feed equipment according to claim 1 does so according to feed equipment

according to claim 2 -- adding -- energization -- the energization force of a member -- transfer -- since the pressure welding of the side of a member and the contact side of a driving shaft is carried out -- the pressure welding -- transfer -- frictional force can be given between the side of a member, and the contact side of a driving shaft therefore -- the case where a turning effort smaller than this frictional force joins a transfer member -- the frictional force -- minding -- transfer -- the case where the turning effort exceeding this frictional force joins a transfer member while rotation of a member can be transmitted to a driving shaft -- transfer -- the side of a member slides to the contact side of a driving shaft, and there is an effect of the ability to be able to make a transfer member race in the shaft-orientations end section of a driving shaft

[0089] Since the connection state of a driving shaft and a feed roller will be canceled by the clutch member according to feed equipment according to claim 3 if a driving shaft rotates in other directions after conveyance of a form is completed in addition to the effect that feed equipment according to claim 1 or 2 does so, a feed roller can make into the state which can be raced in the anti-conveyance direction of a form by release of this connection state. Therefore, when pulling out the form laid in the form attachment component in the anti-conveyance direction, it is effective in the ability to pull out this form easily in the anti-conveyance direction from between a form attachment component and feed rollers.

[0090] the clutch gear to which the load was given by the resistance member when a driving shaft rotated [according to feed equipment according to claim 4] in other directions in addition to the effect that feed equipment according to claim 3 does so -- an arm -- rotation of a driving shaft and the 2nd gear can be interlocked with with the extension section of a member, and a driving shaft can be rocked to an opposite side with the 1st gear side to the center of oscillation Since it is estranged from the 1st gear by this rocking and an engagement state is canceled, a clutch gear is effective in the ability to turn the feed roller connected with the 1st gear in the anti-conveyance direction of a form, and change it into the state which can be raced with rocking.

[0091] if according to feed equipment according to claim 5 a driving shaft is rotated in other directions after conveyance of a form is completed, for example in addition to the effect that feed equipment according to claim 1 or 2 does so, by the clutch member, the turning effort of a driving shaft can be transmitted to a electrode-holder member, the electrode-holder member can be pushed to an opposite side with a form attachment component side, and a feed roller can be made to estrange from the form laid in a form attachment component Therefore, after conveyance of a form is completed, it is effective in the ability to fit a new form over between a feed roller and a form attachment component.

[0092] the clutch gear to which the load was given by the resistance member when a driving shaft rotated [according to feed equipment according to claim 6] in other directions in addition to the effect that feed equipment according to claim 5 does so -- an arm -- rotation of a driving shaft and the 2nd gear can be interlocked with with the extension section of a member, and a driving shaft can be rocked to an opposite side with the 1st gear side to the center of oscillation this rocking -- following -- a electrode holder -- since the electrode-holder frame of a member is pushed by the arm member with the 1st gear side to an opposite side, it has an effect of the ability to make it estrange from the form laid in a form attachment component by this push in a feed roller

[0093] Since it is prepared in a form attachment-component side to a clutch gear, the 1st gear which is connected with a feed roller in addition to the effect that feed equipment according to claim 4 or 6 does so is pushed to a form attachment-component side, where a clutch gear is engaged, and, according to feed equipment according to claim 7, is effective in the ability to be able to push a feed roller against a form attachment-component side by this push. Therefore, when a form is conveyed with a feed roller (i.e., when a feed roller rotates in the conveyance direction of a form by the clutch gear and the 1st engaged gear), a feed roller prevents estranging from a form and it is effective in the ability to convey a form smoothly.

[0094] According to feed equipment according to claim 8, in addition to the effect that feed equipment according to claim 4 or 6 does so, the arm member which supports a clutch gear to revolve Since rocking operation by the side of the 1st gear was restricted by the limit member, when a clutch gear is engaged with the 1st gear Change of the turning effort which can be made to always engage this clutch

gear and 1st gear by the position, consequently is transmitted to the 1st gear by the clutch gear is suppressed, and it is effective in the ability to transmit smoothly [a desired turning effort].

[Translation done.]